TWELFTH
BIENNIAL REPORT
OF THE
BOARD OF HORTICULTURE
OF THE
STATE OF OREGON
1911 - 12

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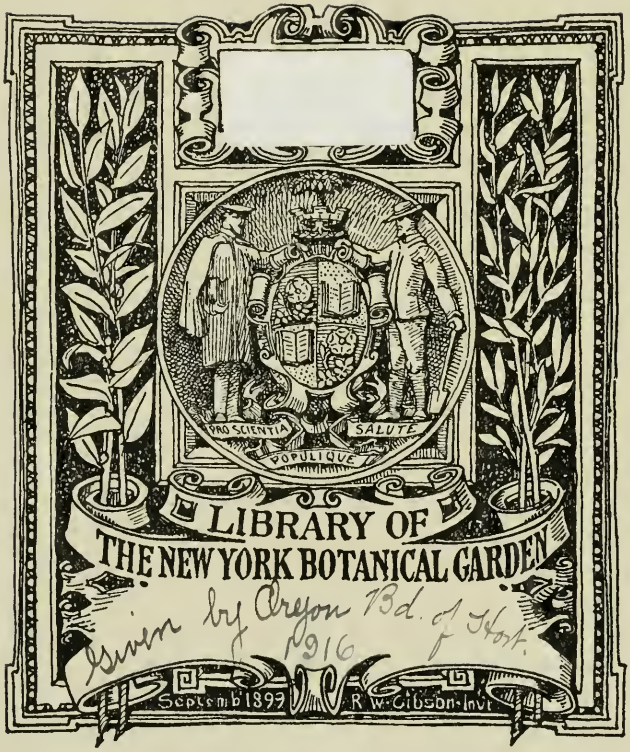
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TWELFTH BIENNIAL REPORT

OF THE

Board of Horticulture

TO THE

TWENTY-SEVENTH

LEGISLATIVE ASSEMBLY

REGULAR SESSION

OF THE

STATE OF OREGON

1913

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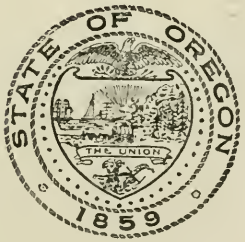


SALEM, OREGON
WILLIS S. DUNIWAY, STATE PRINTER
1913

Loganberries in Bloom—Marion County.

LETTER OF TRANSMITTAL

GASTON, OREGON, January 1, 1913.

To the Honorable the Legislative Assembly of the State of Oregon:

GENTLEMEN: In conformity with the statute which directs the Board of Horticulture to report biennially to you, I herewith submit my report of the work of the board for the years 1911 and 1912.

The board as now organized consists of five members for the five horticultural districts of the State, a commissioner at large and a secretary, and is supplemented by a county fruit inspector for each of the prominent fruit-growing counties. It is the duty of the district commissioner to look after the enforcement of the horticultural laws in their respective districts, to train and supervise their county inspectors, to gather information and statistics, and to attend to inspection of nurseries. The law requires that the commissioner at large, who is *ex officio* president of the board shall visit all the principal fruit-growing sections of the State at least once each year, and the fruit shipping centers during the shipping season, and that he shall at all times meet and address as many fruit growers' meetings and associations as possible.

The efficiency of the inspection work has been greatly increased during the past two years as evidenced by the improved condition of the orchards in general, and especially by the vastly better grade of fruit to be found on the markets. But considerable difficulty has been experienced by the commissioners in securing and retaining the services of competent county inspectors owing to the small remuneration connected with the office.

Section 5491, Lord's Oregon Laws, says that it shall be the duty of the board to report to the legislature, what, if any, legislation is needed in aid of the horticultural and fruit-growing interests of the State. In accordance therewith, I submit a draft of two proposed bills embodying the recommendations of the board in this respect. The points covered in these recommendations are those in which the experience of the board has shown the present law to be weak and in need of amendment. They are briefly summarized as follows:

1. Strengthening the Quarantine Law.—A condition arose

in Oregon very recently which called attention in a forcible manner to the weakness of the present law in this respect. The alfalfa weevil has become a very serious pest in Utah and Wyoming, and it is highly desirable that its further spread be prevented by the stopping of shipments of alfalfa from infected districts into clean territory, but it was found that Oregon has no law whereby such importations can be prohibited, and our growers must run the risk of this infestation until such a quarantine law can be provided. The law proposed by the board is based on the national law and the best provisions of such State laws as are now in force.

2. Providing State Inspector for Portland. — All local inspection is now done by county inspectors paid by their respective counties, but the geography of Oregon is such that the work required in Portland and Multnomah County is out of all proportion to that of any other point. All importations of nursery stocks and fruits from foreign countries are entered here, and this business has grown to such proportions that it alone is sufficient to keep one man constantly employed. This branch of the work should be done by the State, and we respectfully ask that the board be given sufficient funds to employ a suitable man for this work. The county, as heretofore, will continue to take care of the market and local tree inspection.

3. Authority for Additional Inspectors.—In some of the large fruit-growing counties additional help is needed for short seasons of the year, and county courts should have definite authority to appoint such, where needed, and when requested by the horticultural commissioner for the district.

4. Authority for County Inspectors to Enter Upon Private Property in the Pursuit of Their Duties.—Certain cases have arisen where inspectors have been warned that they would enter upon private property at their peril, and it is important that they be fully protected in this respect.

A few other minor changes are suggested.

You will note from the following reports that the value of the fruit crop for the present year has reached the handsome total of over $7,100,000, in spite of the low prices at which the bulk of the crop has been sold. The appended semiannual reports of the commissioners and secretary show in detail the work that has been accomplished and how the funds have been expended, and I respectfully call your attention to them for further details.

W. K. NEWELL,
President State Board of Horticulture.

OFFICERS OF THE BOARD.

W. K. NEWELL - - - - - - - - - - - - - - PRESIDENT
R. H. WEBER - - - - - - - - - - - - - - - TREASURER
H. M. WILLIAMSON - - - - - - - - - - - - SECRETARY

OFFICE: PORTLAND, OREGON.

BOARD OF COMMISSIONERS.

STATE AT LARGE

W. K. NEWELL - - - - - - - - - - - - - - GASTON

FIRST DISTRICT

A. C. GOODRICH - - - - - - - - - - - - - YAMHILL

SECOND DISTRICT

CHAS. A. PARK - - - - - - - - - - - - - - SALEM

THIRD DISTRICT

A. H. CARSON - - - - - - - - - - - - - - GRANTS PASS

FOURTH DISTRICT

R. H. WEBER - - - - - - - - - - - - - - THE DALLES

FIFTH DISTRICT

JUDD GEER - - - - - - - - - - - - - - - COVE

DISTRICT BOUNDARIES.

FIRST DISTRICT

Multnomah, Clackamas, Yamhill, Washington, Columbia, Clatsop and Tillamook Counties.

SECOND DISTRICT

Lincoln, Marion, Polk, Benton, Linn, and Lane Counties.

THIRD DISTRICT

Douglas, Jackson, Klamath, Josephine, Coos, Curry, and Lake Counties.

FOURTH DISTRICT

Morrow, Wasco, Gilliam, Hood River, Crook, Sherman, and Wheeler Counties.

FIFTH DISTRICT

Umatilla, Union, Baker, Wallowa, Malheur, Grant, and Harney Counties.

COUNTY FRUIT INSPECTORS

Baker—Carl C. Mason, Newbridge.
Benton—W. F. Groves, Corvallis.
Clackamas—O. E. Freytag, Oregon City.
Clatsop—B. S. Worseley, Astoria.
Columbia—J. W. Pomeroy, Scappoose.
Coos—P. M. Hall-Lewis, Marshfield.
Curry—
Douglas—F. A. McCall, Roseburg.
Gilliam—T. C. Mobley, Olex.
Grant—B. S. Adams, Prairie City.
Harney—A. F. B. George, Burns.
Hood River—W. H. Lawrence, Hood River.
Jackson—J. W. Myers, Central Point.
Josephine—J. F. Burke, Grants Pass.
Klamath—O. A. Stearns, Klamath Falls.
Lake—A. M. Smith, New Pine Creek.
Lane—Geo. W. Taylor, Eugene.
Linn—D. W. Rumbaugh, Albany.
Lincoln—S. G. Irwin, Newport.
Malheur—J. A. Lackey, Ontario.
Morrow—H. A. Cummins, Heppner.
Marion—C. O. Constable, Salem.
Multnomah — J. E. Stansbery, 582 Windsor St., Portland.
Polk—
Sherman—A. P. Altermatt, Rufus.
Tillamook—
Umatilla—S. J. Campbell, Freewater.
Union—W. W. Randall, La Grande.
Wallowa—
Wasco—J. P. Carroll, Mosier.
Washington — H. C. Atwell, Forest Grove.
Wheeler—
Yamhill—D. T. Williams, Yamhill.

Yellow Newtown Apple Orchard—Jackson County.

PROPOSED LAW RECOMMENDED BY STATE BOARD OF HORTICULTURE.

AN ACT.

To amend Section 5482 of Lord's Oregon Laws, being Section 1 of Chapter 222 of the General Laws of 1905; and Section 5484 of Lord's Oregon Laws, being Section 3 of Chapter 222 of the General Laws of 1905, as amended by Section 3 of Chapter 58 of the General Laws of 1907; providing for the appointment of county inspectors of fruit orchards, etc., defining their duties, rights and powers; authorizing the appointment of deputy county inspectors; requiring common carriers to give notice to inspectors of arrival of nursery stock; providing for the deputizing of inspectors for nurseries, and providing for the compensation of county and deputy county inspectors.

Be it enacted by the People of the State of Oregon:
Be it enacted by the Legislative Assembly of the State of Oregon:

Section 1. That Section 5482 of Lord's Oregon Laws, being Section 1 of Chapter 222 of the General Laws of Oregon of 1905, and Section 5484 of Lord's Oregon Laws, being Section 3 of Chapter 222 of the General Laws of 1905 as amended by Section 3 of Chapter 58 of the General Laws of 1907, be and are hereby amended so as to read as follows:

Sec. 5482. Upon a petition of not less than 25 residents and fruit-growers of any county of this State, the county court of said county shall appoint a county inspector whose duty it shall be to inspect orchards, nurseries, trees, shrubs, vines, fruits, vegetables, plants, packing houses, warehouses, storerooms, farms and other places within said county, and to enforce all laws of the State relating to such insect pests and such diseases as affect trees, vines, plants of any kind, or fruits or vegetables of any kind, and all other horticultural laws of the State; *provided, however,* that the inspector so to be appointed shall be recommended and certified to be competent by the commissioner of the State Board of Horticulture of the district in which said county is situated, and said county inspector shall hold his office during the pleasure of of said county court and of the commissioner of the State Board of Horticulture for said district. With the consent of the county court of any county, the county inspector of such county may appoint one or more deputies to serve during the pleasure of the county inspector and of the county court, but no such deputy shall be appointed until the commissioner of the State Board of Horticulture for the district in which

such county is situated shall certify that the person to be appointed as such deputy is competent and shall recommend his appointment. Every such deputy county inspector shall have and perform all the powers and duties of a county inspector except that of appointing deputies. The county inspectors and deputy county inspectors and all other persons authorized to enforce the horticultural and inspection laws of Oregon are authorized and empowered to enter upon or into any premises, land, buildings, enclosures, or other places, for the purpose of inspecting any article which is subject to or may be subject to infestation with any insect injurious to any article which grows upon or in or from the soil by processes of plant growth, or the eggs, larvæ or pupæ of such insects or with any disease injurious to any such article or articles and for the further purpose of enforcing any of the laws of this State relating to horticultural quarantine, or horticultural inspection or the abatement of horticultural nuisances or any other duties imposed by law upon such inspectors and other persons authorized to enforce the inspection and horticultural laws of Oregon. Every person, firm or corporation doing business as a common carrier within the State of Oregon shall, upon the arrival of any shipment of nursery stock, trees, plants, vines, shrubs, cuttings, or scions at the station or other place to which the same is consigned, notify the State Inspector if there be one in the county in which such shipment has arrived, or if there be no State Inspector in said county, shall notify the county inspector of said county, and if there be neither State Inspector nor county inspector in said county, shall notify the commissioner of the State Board of Horticulture of the district in which said county is situated, of the arrival of such shipment and the date and place of arrival, and shall not deliver such shipment to the consignee until authorized to do so by the State Inspector, county inspector or commissioner or officer of the State Board of Horticulture; *provided, however,* that if such shipment originated within the State of Oregon and the notice be given personally or by telephone or telegraph and inspection has not been commenced within 72 hours from the time of sending notice; or if such notice be sent by mail and inspection has not been commenced within as much time more than 72 hours as is usually required for a letter to go from the place of arrival of such shipment to the residence of the inspector notified, then such shipment originating in Oregon may be delivered to the consignee. It shall be the duty of the inspector or commissioner receiving notice of the arrival of any shipment of nursery stock, trees, plants, vines, shrubs, cuttings, or scions to inspect or cause to be inspected said shipment as

soon as can reasonably be done without omitting the performance of other official duties equally urgent. Upon the request of any nurseryman or tree dealer doing business within the State of Oregon, the commissioner of the State Board of Horticulture for the district in which the shipping place of business of such nurseryman or tree dealer is located may deputize a suitable person to inspect outgoing shipments from said nurseryman or tree dealer, and said nurseryman or tree dealer shall pay such person so deputized for his services while they are required by such nurseryman or tree dealer. In case the shipping business of any two or more nurserymen and tree dealers is not in the aggregate more than one person can properly inspect and such group shall make satisfactory arrangements for the payment of the person making such inspection, the commissioner may deputize a person to inspect the shipments of all members of such group. No person deputized by a commissioner to inspect outgoing shipments of nursery stock shall make any certificate concerning such shipments which is not true, and no person so deputized shall allow a certificate of inspection given by him to be attached to any tree, shrub, vine, plant, scion, bud, or box, crate, bale, bundle or container of the same or of any of them unless he has personally inspected the articles and all of them immediately before signing such certificate which must be dated in writing at the time it is signed. The commissioner may revoke deputization of any such person at any time if he believes such person is not properly doing his duty.

Sec. 5484. Such county inspector and each deputy county inspector shall be paid for his services by the said county the sum of three dollars per day and his actual necessary expenses incurred in the performance of his duties. The county inspector and each deputy county inspector shall report monthly to the commissioner of the State Board of Horticulture of the district in which he is employed the time for which he is entitled to pay during the month for which such report is made and a statement of his actual necessary expenses incurred in the performance of his duties as such inspector or deputy inspector with vouchers for such expenses, and the commissioner shall certify the same to the county court of the county before such compensation and expenses shall be paid. The county court of each county shall supply the county inspector and deputy county inspectors with such blanks, stationery and postage as are needed in the performance of their official duties. If it appear to the county court of any county that it will be for the best interest of the people of such county to do so, it may agree to pay, and pay to its county inspector a larger sum than three dollars per day for his services.

Planting a Portland School Garden--Woodlawn.

CHAPTER 246.

AN ACT

[H. B. 129.]

To provide for the protection of horticulture and to prevent the introduction into this State of insects or diseases or animals injurious to fruits or vegetables of any kind, fruit trees, vines or bushes or growing products of the soil; providing for a quarantine to prevent the introduction of such insects, diseases and animals into the State and their spread from infected districts within the State to uninfected districts; making a violation of this act a misdemeanor and providing the penalty therefor; providing for a State inspector and defining his duties and fixing his compensation; providing that said act shall be an emergency measure and go into effect immediately, and repealing conflicting acts and parts of acts.

Be it enacted by the People of the State of Oregon:

Section 1. That, whenever, in order to prevent the introduction into the State of Oregon of any tree, plant or fruit disease, or of any injurious insect or animal not theretofore widely prevalent or distributed within and throughout the State of Oregon, the Commissioner at Large of the State Board of Horticulture shall determine that it is necessary to forbid the importation of any class of nursery stock or of any other class of plants, fruits, vegetables, roots, bulbs, seeds or other plant products or of any articles which are naturally, or liable to be, the hosts of such injurious diseases, insects or animals, from country or locality where such disease or insect or animal infestation exists, he shall promulgate such determination, specifying the country and locality and the class of nursery stock or other article which in his judgment should be excluded. Following the promulgation of such determination by the Commissioner at Large of the State Board of Horticulture, and until the withdrawal of said promulgation by him, the importation into the State of Oregon of the article or articles specifed in the said promulgation from any country or locality specified in the said promulgation is hereby prohibited; *provided*, that before such promulgation becomes effective the Governor of the State of Oregon shall approve such promulgation in writing thereon, and such promulgation so approved shall have been published in three newspapers designated by the Governor in writing. Whenever the Commissioner at Large of the State Board of Horticulture deems it for the best interest of the State of Oregon to

withdraw such promulgation, he can do so with the written approval of the Governor of Oregon by publishing a notice of such withdrawal in three newspapers to be designated by the Governor. Proofs of publication of such promulgations and withdrawals of promulgations shall be filed in the office of the Secretary of State.

Section 2. The Commissioner at Large of the State Board of Horticulture is authorized and directed to quarantine any locality within the State of Oregon when he shall determine the fact that a dangerous plant disease or insect infestation new to or not theretofore widely prevalent or distributed within and throughout the State exists in such locality. The Commissioner at Large of the State Board of Horticulture shall publish a notice of such quarantine in such newspaper published within or near the quarantined locality as the Governor of Oregon may designate, and the quarantine shall be effective immediately upon the publication of such notice. Such notice must be approved in writing by the Governor before publication. From and after the publication of such notice it shall be unlawful for any person, firm or corporation to carry or transport any article or articles specified in the notice of quarantine from the quarantined locality into or through any other part of the State. Whenever it appears to the Commissioner at Large that such quarantine of said locality is no longer necessary, he shall give notice that such quarantine is no longer in force. Such notice shall be approved by the Governor in writing and shall be published in some newspaper within or near the quarantined locality to be designated by the Governor. Proofs of the publication of the notices provided for in this section shall be filed in the office of the Secretary of State.

Section 3. The State Board of Horticulture shall appoint a State Inspector to hold office during the pleasure of the board. It shall be the special duty of the State Inspector to inspect nursery stock, trees, shrubs, plants, fruits and vegetables and other articles mentioned in this act, coming from points without the State, and to enforce the provisions of this act and all other horticultural laws of the State relating thereto. He shall also have all the duties, powers and rights of a county inspector and is granted jurisdiction to act throughout the State. His salary shall be $1,200 per year and he shall be allowed the expenses necessarily incurred in the performance of his duties. His salary and necessary expenses shall be paid monthly in the same manner as the members of the State Board of Horticulture are paid from the funds appropriated for the said board; *provided,* that his monthly

account shall be first approved in writing by the Commissioner at Large of the State Board of Horticulture. Before entering upon his duties the State Inspector shall make and subscribe an oath to support the Constitution of the United States and the State of Oregon, and to diligently, faithfully and impartially discharge the duties of his office. This oath shall be filed in the office of the Secretary of State.

Section 4. Any person, persons, firm or corporation who shall bring or cause to be brought into the State of Oregon any nursery stock, trees, shrubs, plants, vines, cuttings, grafts, scions, buds, fruit pits, or fruit or vegetables, shall immediately after the arrival thereof, notify the State Inspector, if he be in the county in which such articles are received, of their arrival, and hold the same without unnecessarily moving the same or placing such articles where they may be harmful, for the immediate inspection of said State Inspector or county inspector or other person authorized to make such inspection. If there is no State Inspector in the county in which such article is received, it shall then be the duty of such person, firm or corporation to notify the county inspector of the county in which the article is received. If there is neither State Inspector or county inspector in the county in which such article is received then it shall be the duty of the person, firm or corporation to notify the commissioner of the State Board of Horticulture for the district which includes said county who shall make immediate arrangement for the inspection of such article or articles. The commissioners of the State Board of Horticulture and their deputies, the secretary of the State Board of Horticulture, the State Inspector and the county inspectors and their deputies are hereby authorized and empowered to enter at any time into any car, warehouse, depot or upon any ship within the boundaries of the State of Oregon, whether in the stream or at the dock, wharf, mole or any other place where such nursery stock or fruit or vegetables or seed or other such articles are received, or in which any of such articles are imported into the State, for the purpose of making the investigation or examination to ascertain whether such articles are infested with any injurious insects or their eggs, larvæ or pupæ or other animal or plant disease. If, after such examination or inspection, any of said articles are found so infected or infested, then it shall be the duty of the owner, owners, or persons, firm or firms or corporation having charge or possession thereof to so disinfect at his or their expense such portion or portions of the ship, dock, wharf, mole or car or warehouse or depot where such articles may have been located

in such manner as to destroy all infection or infestation present, and all articles apt to be so infested or infected shall be held until the said articles have been thoroughly disinfected and all injurious insects, or their eggs, larvæ or pupæ or other animal or plant diseases have been eradicated and destroyed; *provided, however,* that all articles of nursery stock, trees, shrubs, plants, vines, cuttings, grafts, scions, buds, fruit pits, fruits, vegetables or seed which are infested or infected with injurious insects or their eggs, larvæ or pupæ or other animals or with injurious plant diseases liable to cause damage in this State, shall be destroyed or re-shipped out of the State as hereinafter provided.

Section 5. When any shipment of nursery stock, trees, vines, plants, shrubs, cuttings, grafts, scions, buds, fruit pits, or fruit or vegetables or seed imported or brought into this State is found infested or infected with any injurious insects or their eggs, larvæ or pupæ or other animals or with any plant disease liable to be detrimental to orchards, vineyards, gardens or farms in Oregon, or any part thereof, and the nature of the animals or insects or diseases is such that there will not be danger of the escape or spread of such animals, insects or diseases if the infested or infected articles are promptly shipped out of the State, then the State Inspector, county inspector or other person duly authorized to make inspection of such articles and who has made such inspection shall notify the owner or persons, firm or corporation having possession or control of said articles to ship the same out of the State within a specified time, the limit of which shall be not less than 48 hours nor more than 10 days, according to the nature of the insects or diseases, and it shall be the duty of such owner or owners, or persons, firm or corporation to so ship said articles, but such shipment shall be made under the direction of the officer making the inspection and shall be at the expense of the owners, his or their agents. In case of a failure of the owner or owners or his or their agents to comply with the notice the said articles shall be destroyed by said officer at the expense of the said owner or owners, his or their agents. When any carload, case, box, package, bale or bundle of such articles is in part infected or infested and the nature of the infestation or infection is such that the portion of shipment which is not infested or infected can be separated from the portion which is infected or infested without danger of escape from the infested or infected articles of the insects, their eggs, larvæ or pupæ, or the animals, or the disease or diseases with which such articles are infested, and the owner or person, firm or corporation having control

or possession of such articles desires to separate the portion not infested nor infected from the portion which is infested or infected the officer making the inspection shall give a permission in writing to make such separation within a time specified in such permission, which time shall be reasonable for the performance of the work, but with due regard to the safety of the State; such permission shall be granted only upon the condition that the owner or owners or his or their agents make such separation and destroy all the infested or infected portion at his or their own expense and under the supervision of the officer doing the inspection or of some person authorized by him to supervise the work of separation and destruction, and shall pay for the services of the person authorized to supervise such work when it is necessary for the officer making the inspection to authorize and depute some person to supervise such work. Whenever the official who makes such inspection has other official work awaiting and it appears that the time required for separating and destroying such articles may exceed one hour, he may authorize and depute some proper person to supervise the separation of the uninfested and uninfected articles from the infested or infected articles and the destruction of the infested or infected articles, and the person so authorized shall be paid for his services by the owner or owners or his or their agents for his services while supervising the separation and destruction of such articles. In case of the failure of the owner or owners, his or their agents to comply with the foregoing conditions within the time specified in the written permission, the contents of every such car, case, box, package, crate, bale or bundle containing articles infested or infected as aforesaid, shall be destroyed at the expense of the owner or owners, his or their agents.

When any shipment of any nursery stock, trees, vines, plants, shrubs, cuttings, scions, buds, fruit pits, seeds, fruits, vegetables or other articles brought into the State are infected or infested with any disease or insects or their eggs, larvæ or pupæ which are injurious to trees, plants, vines, shrubs, fruits, vegetables and other plant growths, and the nature of such infection or infestation is such that the shipment can not be re-shipped out of the State without danger of damage to the orchards, vineyards, farms, gardens and their productions, of Oregon, or to any of them, such shipment shall be immediately destroyed by the State Inspector, county inspector or commissioner of the State Board of Horticulture, who shall have inspected the same, or under his direction.

Section 6. Each carload, case, box, package, crate, bundle or bale of trees, shrubs, plants, vines, cuttings, grafts, scions, buds, fruit pits, fruit or vegetables imported or brought into this State shall have plainly and legibly marked thereon in a conspicuous manner and place, the name and address of the person, firm or corporation shipping the same and the name and address of the consignee; also the name of the country, state or territory where the contents were grown and must show that it contains nursery stock, seedlings or seeds.

Section 7. No person, firm or corporation shall bring or cause to be brought into the State of Oregon any fruit or vegetable or host plant which is known to be, or hereafter may become a host plant or host fruit of any species of the fruit fly family, *trypetidae,* from any country, state or district where such species of *trypetidae* is known to exist and any such fruit, vegetable, or host plant, together with its container and packing, shall be immediately destroyed at the expense of the owner or agent.

Section 8. No person, firm or corporation shall bring or cause to be brought into the State of Oregon any peach, nectarine or apricot tree or cutting, grafts, scions, buds or pits of such trees, or any trees budded or grafted upon peach stock or roots that have been in a district where the contagious disease known as "peach yellows", "little peach", and "peach rosette" or any one of them, are known to exist, and any such shipped into this State shall be destroyed or returned to the point of shipment at the option of the owner or agent and at his expense.

Section 9. Any nursery stock, trees, vines, plants, shrubs, cuttings, grafts, scions, buds, fruit pits, fruits, vegetables or other articles infested with any species of injurious insects, or their eggs, larvæ or pupæ, which would be liable to cause damage to the orchards, vineyards, farms and gardens and their products, or with any disease liable to spread to fruits, vegetables, trees, vines, plants or any other useful product of the soil in Oregon, are hereby declared to be a public nuisance, and the several commissioners of the State Board of Horticulture, the State Inspector or the county inspector who inspects the same is invested with the power to abate the nuisance in a summary manner.

Section 10. Any person violating any of the provisions of this act shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be punished by a fine of not more than $100, or by imprisonment in the county jail for a period of not exceeding three months.

Section 11. The members and officers of the State Board of Horticulture and the State Inspector and the county inspectors are authorized to collaborate with the Department of Agriculture of the United States in all matters relating to the inspection of nursery stock, plants, fruits, vegetables, bulbs, seeds or other plant products shipped into the State of Oregon from foreign countries or from other states or territories.

Section 12. Inasmuch as it is a matter of general knowledge that there now exists in portions of the states of Utah and Idaho a dangerous insect pest known as the alfalfa weevil which does great damage to alfalfa, clover, vetch and similar forage plants, which pest is not known to have yet been introduced into the State of Oregon, but would cause a great amount of damage and loss to the farmers of this State if introduced, and there is imminent danger that this pest will be introduced in Oregon by means of hay brought into this State from the infected sections of the states mentioned, and existing laws make no provision by which quarantine can be established to prevent the introduction of this pest, and it is necessary for the immediate preservation of the public health, peace, safety and welfare that legal provision be made for establishing a quarantine against said pest, an emergency is hereby declared to exist and this act shall be exempt from the power of the referendum and shall take effect and be in full force from and after its approval by the Governor.

Section 13. All acts and parts of acts conflicting with the provisions of this act are hereby repealed.

Filed in the office of the Secretary of State February 26, 1913.

REPORTS OF W. K. NEWELL

President of Board and Commissioner at Large.

APRIL MEETING, 1911.

GASTON, OREGON, April 1, 1911.

To the Honorable the State Board of Horticulture:

It is impossible at the present time to make any reliable predictions as to the fruit crop of the coming season, as you well know, but the indications are good. Conditions so far have been favorable in most all cases; the trees ripened their wood well and went into the winter in good condition, and there has been no excessive cold to do injury. While we have had a few heavy frosts that have perhaps injured some of the very early fruits such as early strawberries, the great bulk of the crop was not sufficiently advanced to be injured at that time.

Nearly all fruit trees are carrying a good supply of strong-looking buds and, barring extremely unfavorable weather, will set a good crop. It is hardly to be expected that the trees which bore the wonderful crop of last year will repeat the performance again this season, but from present appearances even these trees will have a reasonable supply of fruit. With the increased acreage which will come into bearing this season for the first time the total crop of the State should be considerably in advance of that of any previous year.

Colorado is confidently expecting a bumper crop this year, as her crop of last season was very short, and our sister states of Washington and Idaho are also looking for good yields. Considerable preparation has been made at Eugene, Roseburg and in the Rogue River Valley for fighting frost by means of smudge pots filled with fuel oil, and it is hoped that the tests will be sufficiently extensive and accurate to afford definite information upon this subject, in case it becomes necessary to use them at all.

Some progress has been made in the matter of perfecting fruit-growers' organizations; many local unions have been formed and will be ready for business the coming season. While at the present writing it seems improbable that the scheme for a central selling agency for the entire northwest

will materialize this year, the agitation of the question will result in good, by calling attention to the absolute necessity of strong local organizations as the only basis upon which the structure can be erected.

Recent press reports show that the railroads have granted a material reduction in freight rates on fruits from California points east. Our growers should at once demand the same concessions.

In accordance with an act passed at the last session of the legislature, the members of the experiment station staff at Corvallis will establish a number of branch stations for the purpose of studying fruit pests throughout the State. I trust that each of you will make it a particular point to co-operate with them in every way possible.

W. K. NEWELL,
Commissioner at Large.

APRIL MEETING, 1912.

GASTON, OREGON, April 8, 1912.

To the Honorable the State Board of Horticulture:

It is the unanimous opinion among Oregon fruit-growers at the present time that this is to be the "big" year in fruit. All indications point to a heavy yield, and only extremely unfavorable weather can prevent it. The great amount of new acreage that will come into bearing will swell the total, and it will likely tax our machinery for harvesting and distributing. However, it is not well to count our chickens before they are hatched; the time for spring frosts is not yet entirely passed, and our ideas may be materially reduced.

But, in the event of a big crop, the problem of marketing will be a big one. This, of course, is not directly in our line of work, but indirectly we can have a decided influence. First of all, the standard of fruit marketed must be raised materially over that of last year. In a light-crop year the quality of fruit is always lower, and a little more latitude is advisable and even necessary, in the rules regarding marketing, but with a full crop we must draw the lines closer. The producer is entitled to protection against competition from inferior fruit and the consumer is certainly entitled to a pack fully up to standard. Not only must we be careful in inspection of the export fruit, and in that of the large markets, but in that of the smaller markets as well. The interior towns must not be made a dumping ground for stuff that will not stand inspec-

tion elsewhere. Pests may thus be introduced into new sections where otherwise they might be kept out for many years. I would urge that you give this matter a great deal of attention during the coming season and see that all your inspectors are fully posted.

Fruit that is fit only for the vinegar factory should, just as far as possible, be converted into juice at the point of production. Such fruit should not be shipped unless there are absolutely no facilities near at hand for caring for it, and then only under special permit, and direct to a factory.

I would also urge that you give every assistance in your power to the formation of local fruit-growers' organizations. With all that has been said and written on this subject there are still important fruit-growing districts in the State that have no organization. We must keep hammering away on the importance of every fruit-growing community providing its own facilities for marketing its crop in the most profitable manner.

For many years, ever since Prof. Cordley worked out the problem of fighting the apple tree anthracnose, we have been advocating the importance of early fall spraying of the apple tree, and every year's practice shows more strongly the importance of this spraying. And now Prof. Lawrence, employed as a special investigator by the Hood River growers, and at this time also county inspector for that county, has been investigating this problem still further and has become convinced that the larger part of the premature rotting of fruit that has been giving so much trouble of late is due to the action of this most destructive fungus. It therefore becomes of still greater importance to apply this early fall spray in order to kill the spores on the fruit as well as on the branches. Prof. Lawrence advises the application of 4-4-50 Bordeaux or 1-30 lime-sulphur just before the apples are ready to pick. Red apples should be pretty well colored before spraying. Apples so sprayed will of course have to be carefully wiped before marketing, but that will be a small item compared with saving it from rotting prematurely. This will make the spraying most effective for the disease on the branches also.

I am glad to be able to report that the question of standard packages and grades for fruit is at last in a fair way to be settled amicably and to the advantage of all concerned. This question, under the guise of the "Porter Bill," the "Lafean Bill," and the "Sulzer Bill," has been agitated for a number of years, and the northwest growers have felt that the proposed legislation was very unfair to them, in that it provided for a box that we could not well use, and that it failed to give

any credit to superior size and color in its grading rules, and that the methods of inspection were faulty, and lastly, that the penalties for its violation were excessive.

As the matter was brought up in Congress again this winter it became necessary for us to give it further attention, and to that end, Mr. C. E. Whisler of Medford and I went to Washington early in March. We were joined on the way by Judge Fremont Wood of Idaho, who worked in close harmony with us on every point. Representatives from the state of Washington were also sent, but owing to some delay they failed to arrive until after the question was settled. Mr. Joseph Wilson, of Hood River, also joined us at Washington.

The friends of the "Sulzer Bill" were at Washington in full force; the National Fruit Jobbers' Association, the Western Fruit Jobbers' Association, the retail dealers organizations, and practically every fruit-growers' organization in the apple growing states east of the Mississippi River was represented at the conference and the hearing before the Committee on Coinage, Weights and Measures of the House. The friends of the bill had recognized the necessity of compromising with the delegates from the northwest, so a conference was held at the Raleigh Hotel the day before the hearing, March 6th, at which all the representatives were present, and it was agreed that the present bill should omit all reference to the box or basket package and be confined to the barrel alone; that all future objection to the northwest standard box as a standard package should be removed, and that the penalties should be made less stringent. A new bill was then drafted along these lines, and the substitute bill was introduced the next morning by Representative Sulzer of New York, and the entire delegation of fruit-growers and commission men appeared before the committee in its behalf. It is believed that this bill will pass at the present session and take affect July 1, 1912. This then leaves the field clear for us to secure the adoption of our box as a national standard, and it should now be an easy matter. Wherever the eastern growers are taking up the packing of apples in boxes, they are adopting our box, and the Colorado growers are beginning to realize that they must fall in line also. I believe that in future the majority of the fancy apples both east and west will be packed in our box, and that we shall use the eastern barrel for much of our cheaper grades. This was the opinion of most of those present at this meeting. I feel that this meeting will be productive of much good as many misunderstandings were cleared away and the feeling firmly established that our interests were not antagonistic, but mutual, and that we must work together in all things to estab-

lish higher grades of fruit, better marketing and larger consumption.

The probabilities are that the eastern fruit crop will not be very large this year, owing to the heavy crop in many sections last year, and the excessively long cold winter just passed. The southern Mississippi Valley states report prospects very good at the present time.

Another matter that our organizations must take up is the raising of funds for systematic advertising of apples as food. Not one-half the apples are being consumed by our people that there should be. Baked apples could supplant the bulk of the so-called "breakfast foods" to the great advantage of the American people, and a continued campaign of advertising could accomplish it.

W. K. NEWELL,
Commissioner at Large.

ESTIMATE OF FRUIT CROP, 1912.

GASTON, OREGON, December 1, 1912.

To the Honorable the State Board of Horticulture:

I submit herewith my report of the quantity and value of the fruit crop for the State for the year 1912, based on the reports sent in by the commissioners and county inspectors, from personal observation and from all other sources of information available. The total is very satisfactory in quantity, and in view of the comparative low prices at which much of the fruit has been sold, in value also:

Kind.	*Quantity.*	*Value.*
Apples, bushels	3,750,000	$2,812,000
Dried prunes, pounds	18,000,000	1,080,000
Fresh prunes and plums, pounds	15,000,000	725,000
Pears, bushels	550,000	450,000
Peaches, boxes	1,100,000	440,000
Cherries, pounds	12,500,000	475,000
Grapes, pounds	5,715,000	171,450
Strawberries, pounds	12,000,000	360,000
Loganberries, pounds	5,500,000	220,000
Raspberries, pounds	3,500,000	180,000
Blackberries, pounds	2,500,000	75,000
Gooseberries, pounds	650,000	24,000
Currants, pounds	475,000	25,000
Miscellaneous fruits, bushels	25,000	30,000
Nuts, pounds	300,000	40,000
Total value		$7,107,000

W. K. NEWELL,
Commissioner at Large.

REPORT OF A. C. GOODRICH

Commissioner for the First District.

OCTOBER MEETING, 1912.

YAMHILL, OREGON, October 2, 1912.

To the Honorable the State Board of Horticulture:

I beg leave to submit my report as commissioner of the first district:

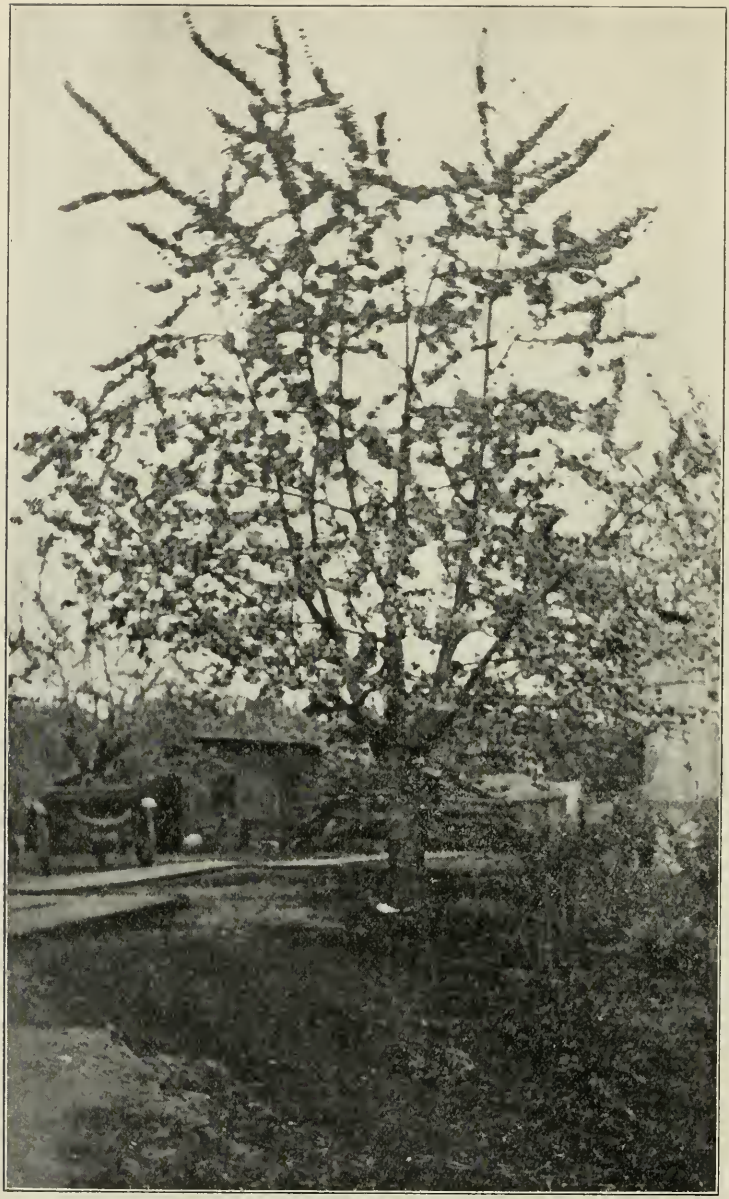
Owing to conditions not under my control I have not been able to visit the orchards in my district nor the displays of fruit at the various fairs as much as I should have liked.

Outside of the prunes, we have had a very good crop of fruit throughout the district and growers have, in the main, had fairly satisfactory prices for that part of the crop that has already been marketed. Berries did better than the unfavorable weather of the early spring would have seemed to warrant, and owing to the very good growing conditions during the summer, and perhaps something to better methods and more thorough cultivation, the cane fruits have made a very favorable growth.

Winter apples have done very well and are much more free from worms than in former years, owing, without doubt, to more intelligent and thorough spraying; though there is much yet to be desired in the matter of the control of apple scab which has not been controlled nearly so well as the codling moth; this is particularly the case with the yellow apples.

Prunes, which are commercially of major importance in this district, have suffered more from a series of untoward conditions than they have during any season in a long time. The early spring gave promise of a bountiful crop, but early blooming combined with cold rain and some frost, though not nearly so severe as the trees withstood in the previous spring, caused a very heavy loss of the fruit from the trees early in the season, and when this was followed by an unusual amount of curl leaf the crop was reduced to a fraction so small we shall not be able to know how small till actual figures are obtainable.

Loganberries have been given much attention of late and if steady and favorable markets can be obtained should prove one of the best money-makers the fruit-growers have; but



A Lambert Cherry Tree in Bloom.

those having in mind the growing of these berries must not overlook the fact that there is no ready-made market for them and that this end of the business will require the most careful attention to make the business profitable.

A. C. GOODRICH,
Commissioner for First District.

REPORTS OF CHAS. A. PARK

Commissioner for the Second District.

APRIL MEETING, 1911.

SALEM, OREGON, April 8, 1911.

To the Honorable the State Board of Horticulture:

Never before has the outlook for the horticulture conditions of the second district been so promising. The past winter has been extremely favorable for all fruits, although within the past week there has been frost on several nights, but I have not learned that any damage has been done. Some of the early fruits are now in bloom, while the later fruits are still in bud.

The past winter and spring have been exceedingly favorable for all necessary orchard work. The pruning, cultivating and winter spraying have been done and there has been a general cleaning up of all orchards, which is the result of a more earnest interest existing among the fruit-growers. Much spraying was done last fall to control the anthracnose on the apple trees, and some recent experiments have been carried on to determine the comparative merits between the lime-sulphur spray and the Bordeaux spray, with the result that the Bordeaux spray appeared to be more effective for controlling the anthracnose. In one instance both of these sprays were separately applied while the apples were on the trees. The spray in each instance adhered to the fruit rather tenaciously, but did no damage. In some instances the fruit was slightly mottled, but this was no detriment to its appearance.

Last year there was a considerable loss of fruit by reason of the bud moth. It is too early yet to tell whether or not the bud moth will make its appearance this season. The bud moth can probably be controlled by adding two pounds of arsenate

A Type of a Willamette Valley Fruit Farm.

of lead to each 50 gallons of lime and sulphur spray when the spray is applied first for scab.

The county fruit inspectors in the various counties have been actively engaged in the general work of cleaning up, and these inspectors are to be commended for the success they have achieved in this general work.

Many new people are coming into the Willamette Valley for the purpose of engaging in the fruit business, and it is safe to prophesy that this part of Oregon will soon be the place where the larger part of the apples of the northwest will be raised.

CHAS. A. PARK,
Commissioner of Second District.

APRIL MEETING, 1912.

SALEM, OREGON, April 6, 1912.

To the Honorable the State Board of Horticulture:

It is my pleasure to report to you that the prospects for fruits for the coming year were never better in the Willamette Valley than they are today. The winter has been mild and the spring retarded so that the very best conditions for fruits of all kinds is our lot. Today the peaches, pears and prunes and some varieties of apples are all in bloom.

We have good, faithful county fruit inspectors in each of the counties in this district, and in some of the counties the county courts have seen fit to appoint two county inspectors. They have been kept busy in waiting upon the people who are seeking information as to the best methods of caring for their orchards so as to produce the best of fruits.

The nursery stock in this district has been carefully inspected. It has been the policy of all the inspectors to inspect each and every bundle and parcel of nursery stock that is shipped from this district, and to also carefully scrutinize all shipments of nursery stock that have come into this district from outside of the State.

I also wish to state that the county courts, who a few years ago seemed to think it economy to have the county inspectors hold back on the work on account of the expense of maintaining the office, today are urging the inspectors to greater effort in cleaning up neglected and menacing orchards.

The new orchards that have been planted so far are being well cared for, and other large tracts are being set out. The fancy price received for prunes, pears and loganberries has

stimulated the setting out of these varieties of fruits. The loganberry is a heavy producer in this section, and the fruit dried has found an appreciative market, so that today all the loganberries that will be handled this year through the local fruit union of Marion County have been sold. The loganberry may be a great blessing to us, since it comes into bearing so soon and will probably stimulate the planting of smaller fruits, which give labor to a large number of people and bring in excellent returns per acre.

The spraying of the orchards is becoming much more general, but the problem of spraying is still one for study. The lime and sulphur spray has been very effective in eradicating the San Jose scale, and it is now being used with very good results in combating the scab on the apples and pears. Most excellent results have been obtained from spraying apples and pears in the spring of the year for scab, three applications being used—one as late as you can before the petals open, the second as soon as you can after the petals fall, and the third from ten days to two weeks from the time of the second application. Various strengths of this spray have been used. We have had very excellent results in using the strength of one to thirty.

The Bordeaux spray appears to give the best results in treating for anthracnose. The early fall rains during the past few years have favored the spread of this fungus trouble before the spray could be applied. Some orchards have been sprayed with Bordeaux spray while the fruit was still on the trees with no ill effects to the fruits and with very good results as to the control of the disease. Where the spray has been applied while the apples are still on the trees it has been necessary to wipe the fruit with cloths which has added somewhat to the expense of the harvest. If any orchard is seriously infected with anthracnose it is far better to spray just after the first rains have commenced in the fall of the year, even if the fruit is still on the trees, and then to follow it up with the second spray in October or November.

The bud moth made an appearance one spring and did considerable damage to the pear and prune crops, but by adding two pounds of arsenate of lead to 50 gallons of lime and sulphur spray in making the first application of the spray for scab this pest has been completely controlled.

We are glad to say that many of the troubles incident to fruit-raising have been controlled, and the profits arising from scientific care of orchards are rapidly making the fruit-growers independent.

CHAS. A. PARK,
Commissioner of Second District.

OCTOBER MEETING, 1912.

SALEM, OREGON, September 30, 1912.

To the Honorable the State Board of Horticulture:

I herewith submit my report for the term ending September 30th of this year.

During the growing season of this year the weather conditions were not favorable for the production of a first quality of fruit. On the 13th, 14th and 15th of April the temperature dropped to 27 degrees, 29 degrees and 30 degrees on the respective nights. This condition occurred when the pears were the size of large peas, apples were in bloom, prunes were in bloom, peaches were set, and strawberries were in bloom; the loganberries had not yet bloomed. This frost thinned out the pears and left frost marks on much of the fruit that stuck on the trees. The skin of the fruit was roughened and somewhat marred, the apples were greatly thinned and weakened, pollination was greatly hindered, peaches were practically killed and prunes were cut very short. There was a great deal of cloudy and rainy weather in the latter part of May which was an ideal condition for the development of scab on the pears and apples, and also for the rapid increase of the aphis on apple trees, so much so that the aphis did more damage generally to the apple crop and trees than has occurred in years. August contributed more than its share of precipitation. We had only ten clear days during this month, which condition had also a tendency to prevent the pears, apples and prunes from finishing up properly. The result from the foregoing condition was that there was a practical failure of the peach crop, about one-third of a pear and cherry crop, one-fourth of an apple and prune crop, but the smaller fruits, including the loganberry, produced a full crop,

The county fruit inspectors in all of the five counties in this district have been doing efficient work. They have accomplished a great deal in giving proper instruction to those engaged in the fruit business, in the way of taking care of the orchards and caring for the fruit. They have also been diligent in keeping the markets free from infected and diseased fruits. A thorough inspection of all the markets in Marion County revealed the fact that not one box of wormy or diseased fruit could be found in the market. The county inspectors have been kept exceedingly busy with the inspection of nursery stock. Marion County grows a great

"Open-Center" Apple Trees.

deal of nursery stock and it has been necessary to put on six deputy inspectors during a portion of the year to look after the shipments of this stock. We have taken great care in inspecting every bundle of nursery stock that has been shipped out of the district so as to prevent any further increase or spread of diseases that are injurious to fruit trees, shrubs and plants.

A few years ago the fruit-growers of the Willamette Valley suffered a severe and unexpected loss from the damage caused by an insect known as the bud moth, which appeared suddenly in large numbers. To give an idea of the damage done that year by this one insect alone, I can state with definiteness that $4,000 was the loss incurred in one tract of 35 acres of Bartlett pears.

In this instance, when the effect caused by the bud moth was discovered, a call of distress was sent to the director of the experiment station of the Agricultural College, who sent two men for one day to investigate the trouble, but it was too late to prevent the damage.

Upon reflection it was evident the fruit-growers, not only of this locality, but in the whole State were losing annually many thousands of dollars just because of their lack of technical information and experience along their lines of work; and that, if the horticulturist, and in fact all agriculturists, could have the advantage of the information to be collected by technical and scientific men who could be in the field and observe conditions, they would be forewarned and forearmed and thus be able to save to themselves and the State this large sum of money which was being needlessly lost.

We found that the experiment station had no funds to send men into the field to investigate and observe the conditions incident to the fruit crop or any other crop. The station had competent men at the head of the various departments, they had the laboratories and the equipment for investigative, experimental and research work along these lines, and that they were willing to do the work if a way could be provided.

The way was provided. When the matter was properly presented to it, the last legislature appropriated a fund known as the "Crop Pest Fund" which was to be used under the direction of the director of the experiment station and the heads of the respective departments of entomology, plant pathology and horticulture, for the purpose of extending the work of these three departments in respect to field survey, investigation and research. To make myself clear, I will state that the fund was secured by the horticulturists of the

Two-Year-Old Bartlett Pear Tree—Rogue River Valley.

State, so that the people of the State with the least expense could use to a greater degree of efficiency these respective departments of our experiment station. This fund is to enable these departments to do other and more work beyond that for which they were already being maintained and equipped. It is less than two years since this fund has been available and I have the pleasure to report to you the departments of entomology, plant pathology and horticulture of our experiment station have each secured several competent and expert men, equipped with the technical and scientific training peculiar to their respective work; that all of these men have been able to push their research work to more extended limits and in some cases to definite conclusions. The horticulturist feels secure when he knows for a certainty the life history of an insect pest and the way in which to control that pest, when he knows the characteristics of an injurious fungus and bacterium and the way in which to control them. This is the character of the information we expect these young men to give us before our crops are lost and our orchards are swept out of existence.

Bulletins will be issued by these departments under the name of "Crop Pest Report" which are for free distribution to all residents of our State, and I suggest that every fruit-grower send to the Agricultural College for a copy of this report.

Chas. A. Park,
Commissioner of Second District.

REPORTS OF A. H. CARSON

Commissioner for the Third District.

GRANTS PASS, OREGON, April 4, 1911.

To the Honorable the State Board of Horticulture:

I respectfully submit the following report for the third district to March 31, 1911:

Fruit trees of all kinds have wintered in good condition at this date. The winter was colder than are our normal winters, but no extremes of temperature have occurred to injure the tree or fruit buds.

The indications are that the bloom on the apple trees will not be as great as it was last year, in fact there will not be bloom enough to afford the trees all the fruit they should carry, should the fruit set.

The apple crop will be a short crop this year in Rogue River Valley.

Pear and peach trees will bloom heavily, and if no cold rains or heavy frosts occur to prevent pollen-distribution, the crop of these fruits will require heavy thinning.

It is usual for peach trees to bloom in the Rogue River Valley from March 10th to 17th. This year blooming is much later, as peaches did not begin until the 25th and are now at this date, April 4th, only in full bloom, with no petals yet dropped. Pear and cherry trees are in full bloom, while the apple is just beginning to show color.

This late blooming is favorable to avoid late spring frosts that sometimes occurs in this valley. All fruit-growers are prepared with oil pots and crude oil on hand, to fire in the event of a frost. The success had by this method the past two years in preventing damaging frosts makes me optimistic as to a fruit crop this season.

Professor O'Gara, at Medford, sends out warnings if the dew point indicates a damaging frost, and by this system every grower that heeds the warning is sure, if he acts, to be in the market next fall with plenty of apples and pears. I know some have not yet been converted to the idea that the fruit-grower can smudge on a cold night and save his crop, but the results had in Colorado, as well as in the Rogue River Valley, are too convincing to the one who has observed them

to permit him to neglect starting the oil pots on a frosty night. The oil pot and smudge fire to protect fruit from severe frost have come to stay in this valley, and those of little faith in the virtue of smudging at this time will be converts to the system after losing a crop or two, and seeing their neighbors who did smudge have loaded trees which they have to thin.

March has been a very dry month here, but a trace of rain having fallen during the month. Warm sunshine during the days and cool nights. This condition has been fortunate, as it put all the orchards in such condition that the power sprayer could work and do thorough spraying with the lime and surphur for scale. In fact spraying for scale has been this year 50 per cent better in the orchards of this valley than ever before. Then, too, the ground being dry, has made it possible for the fruit inspectors to make a thorough inspection for hold-over cases of fire blight, and have the germs of this disease cut out and removed. A small army of trained inspectors under the direction of Professor O'Gara have worked every day during March, and their work has been so carefully done that it is now believed we have the blight under control. I see it reported that the Willamette Valley is, from climatic conditions, immune from the fire blight. I hope it is true, but did I have jurisdiction over any portion of the Willamette Valley as commissioner I confess, with the practical knowledge and experience I have had in the past five years in the Rogue River Valley, I would watch for indications of the blight very closely in that valley.

Tree planting in this valley the past winter has been greater than ever. It is now estimated that Jackson County has 60,000 acres planted to fruit of all kinds, the apple and pear leading in acreage. The Umpqua Valley also has planted a much larger acreage this past season than ever before. Prunes have been largely planted in that valley, as well as the apple and pear. The large profits had from prunes the past three years in Douglas County have stimulated greater planting of that fruit.

Viewing the possibilities of the fruit industry of this valley from the success had in the past, where the soil the orchard is planted on is right, and the man who directs it is right, this valley has from a horticultural view much success to anticipate as the orchards grow older and come into bearing.

A. H. CARSON,
Commissioner for Third District.

APRIL MEETING, 1912.

GRANTS PASS, OREGON, April 7, 1912.

To the Honorable the State Board of Horticulture:

I respectfully submit my semi-annual report for the third district. All fruit trees in my district have gone through the winter in fine shape. We have not had any severe cold the past winter nor warm spells to quicken the sap of the trees followed by sudden fall of temperature, hence have had no injury from that source.

Our winter rains have not been normal, but during March we had two heavy showers, and conditions were such that the soil absorbed all that fell which made good plowing for getting orchards in condition.

The indications now are that all kinds of fruit trees will bloom very heavily and if no late injurious frosts are had the fruit crop will be very large; in fact, should all the bloom set it will necessitate much labor to thin down, so as to not overburden the trees, and make good-sized fruit. Nearly all growers in the valley have their smudge pots and oil on hand, prepared to fire in the event of dangerous frosts occurring.

February was comparatively a dry month this season and made conditions easy to do the necessary spraying for scale. I have noted that spraying has been more universal all over the district the past winter than I have ever seen before. Then, too, the growers are doing their spraying more thoroughly. Experience has taught them that to get the best results it must be done carefully, and every twig on a tree sprayed to destroy the scale.

Tree planting the past winter has been heavy, but not to the extent of the previous winter. As usual, the apple and pear are planted largely. Peaches are being planted in Douglas and Josephine counties, yet not to the extent in acreage that the apple and pear are. Many large orchards are planted to these fruits for the purpose of sub-dividing in small tracts. Where the land is adapted to the apple and pear no doubt these small tracts will become valuable, providing the buyers cultivate and bestow the necessary labor of pruning, spraying, etc. I have noted many acres planted on soils that I fear will be a disappointment to the planters when the bearing age arrives. I know many of our eastern friends think any kind of Oregon dirt will grow apples and pears with success. My observation is that the land cannot be too good to grow the best apples and pears on. In fact,

those growers that have the best soils, deep alluvial land along the streams, are the men that are having the greater profits from their apple and pear orchards.

A. H. CARSON,
Commissioner for Third District.

OCTOBER MEETING, 1912.

MURPHY, (GRANTS PASS), OREGON, October 2, 1912.

To the Honorable State Board of Horticulture:

I herewith respectfully submit my final report for the third district, embracing the counties of Coos, Curry, Douglas, Josephine, Jackson, Klamath and Lake for the years 1911-12.

The year 1911 proved to be an off year for fruit production in the third district. The heavy crop of all fruits in 1910, followed by an unusual drouth so weakened the vigor of the trees that in the spring of 1911 there was but little bloom on the apple. Pear trees bloomed much better, hence the bearing pear orchards did much better in production than the apple that year.

The spring of 1912 found all fruit trees, after the short crop of 1911, vigorous, with a heavy bloom, with the result this year this district will market a heavy crop both of apples and pears. This year's crop of apples and pears are of very fine quality, both in size and color.

The pear crop, such as the Bartlett, Howell and Beurre Bosc, have already been marketed with satisfactory prices to the growers.

The Comice pear in and about Medford bore heavily this year, and the fruit was very fine in quality. The crop of Comice I saw on the famous Hill-Crest orchard near Medford was as near perfect as any fruit I have ever seen. The system of management of this orchard, with the adaptability of the soil to grow the pear, as well as the apple, makes it possible for this orchard to pack and market the best of fruit. An inspection of the Hill-Crest orchard shows thorough cultivation, and from the smooth, clean fruit it is evident the management of this orchard saw that every detail of spraying was done.

In many orchards in Jackson County I noted this year that cultivation has not been the best. In the end I feel sure the owners of these poorly cultivated orchards will lose in growth and productiveness much more than the cost of good cultiva-

Six-Year-Old Bartlett Pear Trees, Near Medford.

tion. It is mistaken economy to not cultivate young orchards well and thoroughly. When a young orchard arrives at a bearing age, if it has had thorough cultivation its vigor is such that it has the vitality to bear the best of fruit in quality and in quantity, and when it does bear, it will produce much more fruit than a neglected orchard, one that has been poorly cultivated.

Many new orchards in Jackson, Josephine and Douglas counties were planted last season. If I can impress the fact upon the owners that the value of these new orchards will be in the proportion of labor bestowed in good cultivation, spraying, and in intelligent pruning, I shall feel that those who do all this well have an assurance of success.

During this growing season we have had an abundance of rain with cool nights, which have been favorable for maturing the apple and pear, but it has been an unfavorable year for the grape. The crop is a light one. Too much moisture, followed by cool nights and cloudy days are not favorable conditions for the grape, hence our short crop. Berries of all kinds did well, were fine in quality, and sold readily at good prices.

FIRE BLIGHT.

This disease has been a perplexing one for the fruit-growers of Jackson and Josephine counties. It has been a costly disease to control. At one time, some four years ago, it seemed the disease would destroy the orchards of these two counties, but, through the energy of Professor O'Gara, with the assistance of the county inspectors of Jackson County, this disease is about a thing of the past. It may exist yet in a few isolated cases, but, in all commercial orchards that were at one time diseased it has been eradicated. It is not a disease that can be reached with the spray pump, and the only possible method of destroying it is to cut out the diseased germs. It has been no easy task to look over the many thousands of apple and pear trees in Jackson County, and find the diseased hold-over cases, and cut out and destroy them.

SCALE.

I have noted in nearly all the orchards of the third district this year but very few scaly fruits. The spraying with the lime and sulphur compound is becoming universal, which accounts for the few scale found. It is evident the continued urging of the use of the spray pump by this board has made an impression on the orchard men. The want of faith a few years ago among the orchardists has, since they have seen

results by careful spraying to control insect pests and fungous diseases has gone, and now they know they have control of these pests and can save their fruit by the use of the spray pump.

While this year, owing to the great moisture and cool climatic conditions that have prevailed, has been favorable for the development of apple anthracnose the growers have learned by repeated experiments that Bordeaux mixture sprayed on the tree as soon as the apples are gathered is sure to prevent new growth of the fungus the winter and spring following.

INSPECTION.

The fruit inspectors in the third district have been active, and through the authority given the State board by the law through these inspectors much of benefit to the fruit industry has been accomplished.

Inspector J. W. Myers of Jackson County, with several deputies, J. F. Burke of Josephine County, F. A. McCall of Douglas County and P. M. Hall-Lewis of Coos County, have been active and done careful inspection work that has been a benefit to the fruit industry of their counties. At the beginning of their inspection work they did not have the co-operation of the growers they should have had. Now the opposition has ceased and the growers see that the inspectors are an aid to them in suggesting how to identify insect pests and fungus diseases, and the proper remedies they should use to free their orchards of pests and fungus and make their trees healthy and vigorous.

COOS COUNTY.

Last June I spent two weeks in horticultural work in Coos. I found the demands of the people of that county so insistent for horticultural knowledge that I could not ignore it. I held a number of meetings in the county and was surprised at the interest shown on best methods to develop fruit-growing in that section by the liberal turn-out at these meetings by all classes.

At these meetings I was fortunate in having the assistance of Professor Jackson on plant diseases and Professor Wilson on insect pests, both of the Oregon Agricultural College, Corvallis, and Professor Reimer of the experimental station at Medford, Oregon. Many fruit-growers of Coos County were with us in the orchards, and this gave the professors an opportunity to teach them how to identify

injurious fungous diseases and insect pests, and the remedy for the same. The interest taken by so many fruit-growers at these orchard demonstrations, and the attention they gave the professors while lecturing in the field convinced me that our visit to Coos will see better methods inaugurated and more careful thought given to better fruit in that county.

Professor Reimer was active at all times on the trip, testing various soils found in that county. Also he, with others of our party, pointed out the possibilities of the future of the loganberry in that county, and the Gravenstein apple from a commercial standpoint.

Coos County can grow the finest loganberries, and Gravenstein apples of any section I have visited in Oregon. In fact, that county can, if her people will take hold of the production of these two specialties, have a monopoly, with rail transportation. There is hardly a limit to the yield of the loganberry in that county on her various soils. A few years ago it was thought that this berry was limited to the local market, and, as a matter of course, its planting in large quantities was not encouraged. It has been found it will not thrive east of the Rockies; then, as our people learned how easy it was to evaporate, and the demand in the eastern markets for evaporated loganberries, the planting of them has increased. Again, it has been found there is no fruit equals the loganberry for unfermented juice for soft drinks. Where this juice has been used it has become so popular that it has taken the place of grape juice and all other unfermented fruit juices. This being true, in such favored places for its growth as is Coos county, it is only a question of time and push of the people when they can build up an industry with the loganberry for its foundation that as a wealth producer will soon divide the honors with her dairy output.

One of the prime factors of the loganberry raised on commercial lines is the large amount of labor that enters into its production. It ripens at a season of the year, in June and July, when our public schools are closed and make available a host of school children to gather the berries. This fact makes it possible for women and children to earn many a dollar towards their annual living that they could not earn in more laborious work. The gathering of loganberries is light labor, a labor that would give out-door employment, and could not in any way impair the health of the growing boy or girl. Any community that can build up an industry which will make it possible for women and children of the poor to earn a reasonable wage is building up its local wealth and welfare.

FIELD WORK.

During the past two years I have visited the principal fruit centers of the district, have personally inspected many orchards and consulted and advised with the county inspectors in nearly all the counties of the district, and have held a number of fruit-growers' meetings and spoken on topics pertaining to better methods of fruit industry. The interest shown by the good attendance at these meetings indicated a universal desire among the fruit-growers to get the experience of those who have made a success.

The past two years I have had many letters from fruit-growers all over the district pertaining to all phases connected with fruit. I have distributed among them 800 copies of the eleventh Biennial Report of this board, the number alloted my district, and have had many applications for this report that I could not fill for want of copies.

The past two years I have noticed the fruit-growers are beginning to grow garden truck and feed for the stock they use for cultivating their orchards. Several years ago the growers bought much of their garden truck from California truck growers, and depended for their income from the sales from their orchards. This is a healthy change, and every grower should be encouraged to grow in his own garden such garden truck as he has to have for home use, rather than pay transportation charges on the same to growers of truck in other states. No doubt much of the high cost of living we now see being discussed in the public press can be assigned to the system of too many farmers specializing in one crop alone, and not diversifying. Where the fruit-grower specializes on fruit alone for several years, while waiting for his orchard to become productive, he has no income from capital invested. He is constantly paying out money for bare necessities in place of setting aside a plot of his land and growing the necessary garden truck and feed he has to have. The facts that consumption is greater than production, or that the consuming class has increased, while the producers have decreased, with the costly methods of distribution, no doubt would in part explain the high cost of living. That farm products have greatly fallen off in this section I have noted. A few years ago nearly all the farmers of this locality had a surplus of all kinds of farm products. Nearly every farmer had a surplus of bacon and hams to sell, while now many of them are going to their grocer and buying their bacon and hams at prices that are virtually prohibitive to any man that pretends to any reasonable business system. Then, too, many

farmers that have lands here in this favored section, owing to increased land values of the past few years, have greatly neglected their calling, and have become land speculators. On paper they figure their wealth on the fancied values of speculation, forgetting that the real wealth of any individual or any community, lies in its producing more than it consumes. We have the soil and climate that will produce any crop planted and attended to. The reason for the falling off of production of farm products is the system our people have practiced. In fact, I have always observed that any section that depends on the products of the soil for their wealth, growing but one crop, never meets with the success that is had by a farming community that grows various crops. Fruit-growing is a business, calling for intelligent business qualifications, but no fruit-grower should depend for the necessities he has to have for his family upon going into the market and buying them; he should grow them.

The following estimate for fruit produced and marketed in the third district for the years 1911-12 is very near the actual output:

DOUGLAS COUNTY.	*1911*	*1912*
Apples, car lots	40	70
Pears, car lots	15	35
Peaches	5	8
Prunes (dried) car lots, 40,000 pounds each	100	150
Strawberries, car lots	4	5
Loganberries, car lots	3	5
Blackberries, car lots	2	3
Gooseberries, car lots	1	3
Cherries, car lots	2	4
Total cars	172	283

JACKSON COUNTY.		
Apples, car lots	150	600
Pears, car lots	120	250
Peaches, car lots	20	25
Strawberries, car lots	3	6
Loganberries, car lots	2	5
Blackberries, car lots	5	7
Cherries, car lots	6	8
Total cars	306	901

JOSEPHINE COUNTY.

Apples, car lots	20	100
Pears, car lots	15	30
Peaches, car lots	20	35
Strawberries, car lots	3	5
Loganberries, car lots	1	2
Cherries, car lots	2	2
Total cars	61	174

COOS COUNTY.

Apples, car lots	10	15
Pears, car lots	3	4
Total cars	13	19
Total cars for Third District	552	1377

It must be noted that there are thousands of acres of young orchards in the third district not yet at bearing age; this explains the output as compared to the acreage in fruit.

A. H. CARSON,
Commissioner for Third District.

REPORTS OF R. H. WEBER

Commissioner for the Fourth District.

APRIL MEETING.

THE DALLES, OREGON, March 30, 1912.

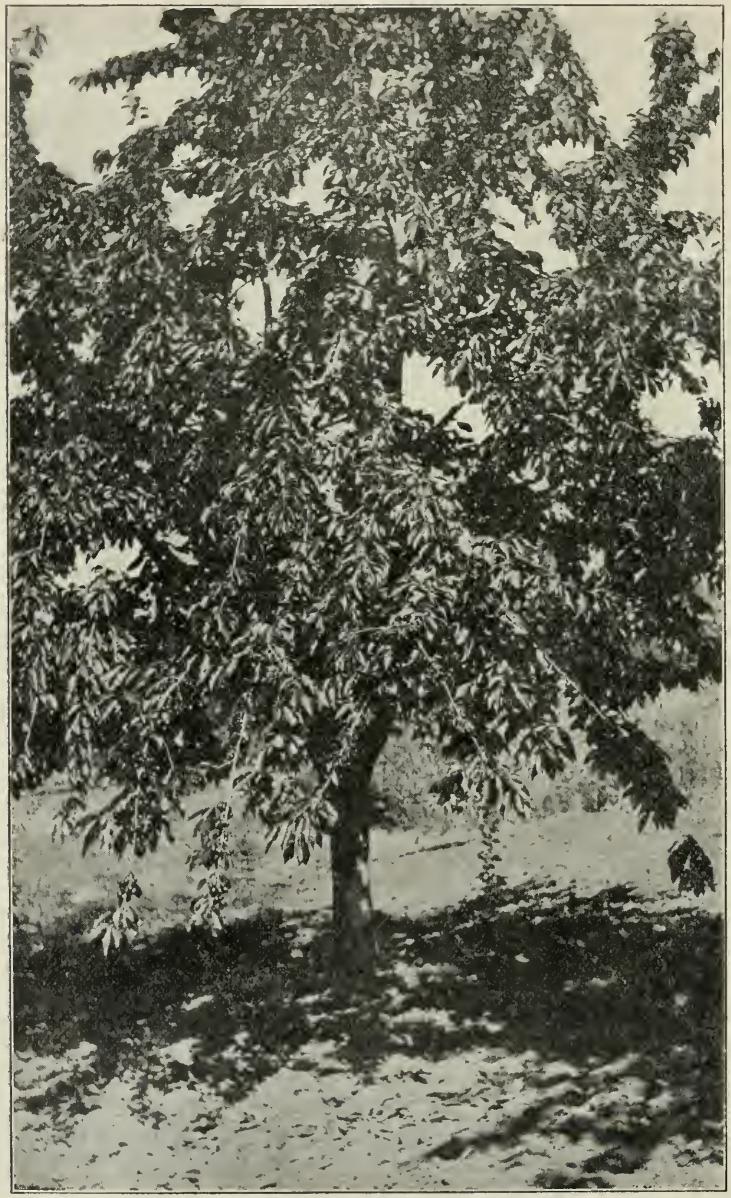
To the Honorable State Board of Horticulture:

With the greatest precipitation ever recorded and the blooming season much delayed, owing to the chilly weather of March, thus greatly diminishing danger from damaging frosts, fruit-growers are confronted with the finest prospects for a crop in the history of the industry in this district.

This time last year cherries, apricots and peaches as well as soft-shell almonds were entirely through blooming, and the fruit had set, while at this time these varieties are just breaking into bloom, making a difference of three weeks at least in the blooming period, correspondingly reducing the chances of injury by frosts, which seldom occur later than the 10th of April in this section, and apples, pears, prunes and plums which are just now beginning to show slight swelling of buds are sure to make immense crops, as these will not be in bloom for some days after the latest recorded date of damaging late frost.

Coupled with the prospects for a very heavy crop of all kinds of fruit comes the promise of good prices. Buyers are at this time busy interviewing growers and making satisfactory offers, with the result that the cherry crop amounting to considerable over 1,000 tons this year from present prospects, has been contracted at very remunerative prices, the same to be used entirely for maraschino, for which the cherries of this district are specially adapted, owing to their extreme firmness and uniform size, as well as the entire absence of split fruit, which is never found in this district on account of the entire absence of rains during the ripening season.

Stimulated by the strong demand, and the ease with which cherries can be grown around The Dalles, many thousands of young trees are being planted this spring, mostly of the Royal Ann variety, they being in extremely heavy demand for canning and maraschino purposes, always commanding a price leaving a good profit to the grower, and cash paid for every load as fast as delivered at the factory, an item of considerable importance to the grower, as it makes cherry-growing as



Royal Anne Cherry Tree—The Dalles.

staple a business as raising wheat, and much more interesting and profitable, as instances are on record where an individual tree will bring as much revenue as an entire acre of the finest crop of wheat. Deep, alluvial, well-drained soils are required for the profitable production of cherries, and in this the section surrounding The Dalles abounds, and it may be safely said that The Dalles district is as famous for its cherries as Hood River for its high-grade apples.

Large plantings of Italian prunes are also being made this spring on account of the high prices prevailing for this article during past several years.

Prunes grown in this section, unlike many other districts in the northwest, are shipped exclusively in the fresh state to our large eastern cities, where they command a ready sale at highly remunerative prices.

Peaches and apricots are receiving their share of attention, and many acres are being set to these varieties, mostly of sorts adapted to canning. Principal of these are the Phillips Cling peach and Royal apricot, which command good prices at local canneries and are very productive.

In the Hood River and Mosier sections large plantings of apples are being made. These districts have prospects for immense yields of their duly celebrated Yellow Newtown Pippins, Spitzenburgs and Ortleys, and make comment here quite unnecessary, for they have spread Hood River's fame both far and wide.

Note must be made however of the increased planting of pear trees in the Hood River Valley; varieties largely Beurre de' Anjou, Bartlett, Beurre Bosc and Winter Nelis. It having been found that these varieties will yield immense crops of high quality fruit, and being in great demand at highest market prices in our populous eastern cities, it is safe to say that within a few years the shipment of pears from Hood River will amount to hundreds of cars annually.

To the Dufur section in Wasco County belongs the distinction of setting the largest individual apple orchard, not only of the great northwest, noted for its vast enterprises, but of the entire United States, and perhaps the whole world. For here one firm will this season finish the planting of 4,000 acres to apples exclusively, consisting principally of Yellow Newtown Pippin, Spitzenburg, Jonathan, Winter Banana, and some other leading varieties. This plantation presents a veritable hive of activity; scores of men and horses are busily engaged in performing the various labors necessary in the conducting of the work required in the production of an orchard on strictly scientific and up-to-date principles. Here,

too, can be seen an oil tractor pulling spring tooth harrows cutting a swath over twenty feet wide.

In addition to this large tract, many other extensive orchard plantings are being made in the Dufur district, consisting mostly of apples, though pears and cherries are receiving more or less attention. The Fifteen-Mile Valley, in which the beautiful little town of Dufur is located, is specially adapted to pear culture, a fact fully recognized by the owners of land in this valley, which is fertile and productive almost beyond description.

Summing it all up, the fourth horticultural district is showing wonderful progress in horticultural lines and furnishing homes for many new settlers attracted by its fertile soils and unsurpassed climate.

R. H. WEBER,
Commissioner for Third District.

OCTOBER MEETING, 1912.

THE DALLES, OREGON, October 14, 1912.

To the Honorable State Board of Horticulture:

Herewith I respectfully submit my report as commissioner of the fourth horticultural district for the year 1912.

This district covers a large area consisting of the counties of Hood River, Wasco, Sherman, Gilliam, Morrow, Wheeler and Crook. Hood River is the most westerly county in this district, being located in the heart of the Cascade Mountains; next east of Hood River County is Wasco, and these two counties represent the commercial fruit-producing section of the district, for nearly all orchards of commercial size are located in these two counties, though Sherman and Gilliam each have several orchards from which fruit is exported, but the average season finds the home demand sufficient to consume the entire crop.

All varieties of fruit bore a heavy crop this season excepting cherries and pears, these being injured by cold, rainy weather during blooming season, reducing the crop to about one-half the estimated normal yield.

Planting of orchards continue in all parts of this district, and it is a safe prediction that the crop from now on will double every two or three years. Largest plantings consist of apples, and many thousand trees of these will again be set out this fall and next spring. Pears, cherries, peaches and apricots are also being planted quite extensively, while prunes

and grapes are receiving considerable attention. The two latter are grown most extensively and to great perfection at The Dalles, from where many carloads of both are shipped annually to the large coast and eastern cities where they bring highly remunerative prices which has encouraged large increase in the acreage of these fruits during the last few years.

The table herewith presented gives a summary of fruit crop produced in the fourth district for the year 1912, and is a convincing argument of the steady increase and of the growth of the industry in the district.

HOOD RIVER.

Apples, boxes	700,000
Pears, boxes	9,000
Cherries, boxes	10,850
Strawberries, crates	45,000
Peaches, boxes	10,000
Blackberries, crates	2,500
Raspberries, crates	1,000

MOSIER.

Apples, boxes	40,000
Pears, boxes	500
Prunes, crates	16,000
Plums, crates	2,000
Strawberries, crates	1,200
Apricots, crates	500
Peaches, boxes	4,000
Cherries, boxes	4,500

THE DALLES.

Apples, boxes	30,000
Pears, boxes	25,000
Peaches, boxes	180,000
Prunes, crates	100,000
Plums, crates	16,000
Apricots, crates	12,000
Strawberries, crates	5,000
Raspberries, crates	500
Blackberries, crates	1,100
Cherries, tons	700
Grapes, tons	600

R. H. WEBER,
Commissioner for Fourth District.

REPORT OF JUDD GEER

Commissioner for the Fifth District.

COVE, OREGON, November 19, 1912.

To the Honorable State Board of Horticulture:

Herewith I have the honor to present to you my semi-annual report. I am pleased to report that in the fifth district this season was fully 90 per cent of a full crop, and the quality above the average. Though the apple market has not been as brisk as usual at this time of year, there is no reason why the growers should not get fair prices for good quality stock.

The past season was peculiar, in that we had few warm nights, which I believe accounts to a great extent for the light ravages of the codling moth. There are fewer wormy apples this season than for several past years. Fire blight made its appearance this year in the worst form I have ever seen it, but the county courts are taking a great interest, and doing all they can to assist the county inspectors and myself to clean it up. The Union County inspector will start next week with two assistants and cover the entire county, pruning the blight out. So, I believe, we will put a pretty thorough check to it.

The cherry crop was first-class. The black cherries were shipped fresh, while the Royal Anns were practically all sold in bulk to be made into maraschino cherries, at from $65 to $80 per ton.

While the prune crop was not up to the average in some parts of the district, yet as a whole, was good, and the growers got good prices. About half the crop was dried and the rest shipped fresh.

There have been hundreds of thousands of trees planted in the fifth district in the past three or four years, but to get at the actual number or acreage planted I find an utter impossibility. The varieties planted have been mostly apples and cherries, though the demand for prune trees is increasing.

Following is an estimate of the fruit crop for the past season:

UMATILLA COUNTY.

	Carloads.
Apples	700
Prunes	215
Pears	30
Peaches	200
Cherries	45
Strawberries	55
Grapes	25

UNION COUNTY.

Apples	550
Prunes	50
Pears	10
Cherries	40
Plums	15
Strawberries	10

MALHEUR COUNTY.

Apples	40
Pears	5
Prunes	25
Peaches	5

BAKER COUNTY.

Apples	35
Pears	6
Prunes	10
Peaches	20

JUDD GEER,
Commissioner for Fifth District.

SPRAYS AND SPRAYING.

Prepared for the Eleventh Biennial Report of the State Board of Horticulture by Prof. A. B. Cordley, dean of the Oregon Agricultural College and entomologist of the Oregon Experiment Station, and revised for this report by Prof. H. S. Jackson, plant pathologist of the Oregon Experiment Station, and Prof. H. F. Wilson, assistant entomologist of the Oregon Experiment Station.

Knowledge of a multiplicity of sprays is not essential to success in spraying. Equipped with an understanding of the range of usefulness of three or four standard sprays, with a good spray pump, and with a determination to do thorough work, one is as well fortified as may be against most orchard pests. Therefore this article will be brief. In practically all of the orchard spraying done in this State but three kinds of spray are used, and probably one of these may soon be largely dispensed with. To treat of more is but to waste time and space and to lead to confusion.

Most growers now understand that spraying is primarily to prevent loss from insects and from fungous diseases, and that a spray which is effective against one pest may be totally ineffective against another. Still, for the benefit of the novice, it may be necessary to emphasize the fact that there is no cure-all. Poisons like arsenate of lead or paris green are used to destroy codling moth and other insects which actually swallow plant tissues—usually caterpillars and beetles which feed upon leaves. They have little or no value as fungicides and are not effective against San Jose scale, plant lice and other sucking insects. Bordeaux mixture is used to *prevent* attacks of fungous diseases and has but little value as an insecticide. Lime-sulphur is both an insecticide and a fungicide. Its range of usefulness is therefore greatly increased, but it is not a cure-all.

As intimated above, the three principal sprays in use in this State are arsenate of lead, Bordeaux mixture, and lime-sulphur solutions.

ARSENATE OF LEAD.

Arsenate of lead is now the chief poison used in spraying for the codling moth, although paris green is cheaper and gives approximately as good results. Many brands of commercial arsenate of lead are now to be had, and so far as our observations go all are reasonably pure. The various brands may, however, be arranged into two definite groups which may be termed the acid arsenates and the neutral or normal arsenates. While the evidence is not conclusive, it appears to be true that the acid arsenates have some tendency to injure foliage and that they cannot so well be used with the lime-sulphur solutions as can the neutral arsenates. While the available evidence upon the above points is not sufficient to justify one in condemning the acid arsenates, growers are advised to use neutral arsenates wherever possible.

Most manufacturers advise the use of three pounds of arsenate of lead to 50 gallons of water. The Washington

Experiment Station has demonstrated that in the dry climate of Eastern Washington one pound to 50 gallons gives equally good results in controlling codling moth. We have found that two pounds are sufficient in the Willamette Valley. It is quite probable that one pound may be sufficient here, but since this has not been demonstrated we think it best to advise two pounds to 50 gallons for the more humid portions of this State.

Some growers prefer to prepare the arsenate of lead as it is used. This is but little if any more troublesome than to mix the prepared arsenates in water and should be somewhat cheaper. It can be readily prepared after the following formula:

Arsenate of soda	4 ounces
Acetate of lead	11 ounces
Water	15 to 20 gallons

Dissolve the arsenate of soda in two quarts and the acetate of lead in four quarts of warm water. When dissolved add them to the required amount of water.

This formula is especially valuable for spraying very delicate foliage or for use against insects which are killed only by large amounts of poison, since it can be used upon plants in much stronger solutions than the other food poisons without injury to the foliage.

If it is desired to use a combined insecticide and fungicide, arsenate of lead may be added to Bordeaux or to lime-sulphur solution in the same proportion as when water is used.

BORDEAUX MIXTURE.

Bordeaux mixture has long been the principal spray used as a preventative of fungus diseases of plants, and while other sprays, notably the lime-sulphur mixtures, give promise of largely supplanting it for certain purposes, it still remains one of the most important orchard fungicides.

Bordeaux for winter use may be made as follows:

Copper sulphate, 6 pounds;
Quick lime, 6 pounds;
Water, 50 gallons.

This is known as the 6-6-50 formula. It should be used only upon dormant trees.

When the trees are in leaf the following 4-4-50 formula is used:

Copper sulphate, 4 pounds;
Quick lime, 4 pounds;
Water, 50 gallons.

A weaker formula known as the 3-6-50 formula, is sometimes used on plants of tender foliage. In Oregon the formula has been successfully used on the peach foliage for prevention of fruit spot but it is without doubt safer to use the self-boiled lime-sulphur.

Copper sulphate, 3 pounds;
Quick lime, 6 pounds;
Water, 50 gallons.

It is of great importance that Bordeaux be properly made. The mixture must be made fresh each time it is used. The ingredients may be stored in stock solution indefinitely, however. Always use wooden or earthen vessels in preparing Bordeaux or the solution of blue stone.

When large quantities of Bordeaux mixture are required, it is most convenient to have stock solutions made up containing one pound per gallon of the respective ingredients. Take a 50-gallon barrel of water and suspend near the top a coarse sack containing 50 pounds of crystallized or granulated commercial copper sulphate. It will dissolve in a few hours. It is convenient to arrange this the night before the spraying is to be done. In another barrel place 50 pounds of lime freshly slaked. For this purpose choose clean stone lime of the best quality. Slaking should be done carefully. Water should be added a little at a time so that slaking will take place rapidly. The process should be watched carefully and the mixture stirred constantly while the slaking is going on, adding water as needed to prevent burning, as lime should never be allowed to become dry while slaking or it will burn, nor should it become entirely submerged with water. The mixing can be conveniently done with a hoe. When thoroughly slaked make up to 50 gallons with water.

If small quantities only of stock solution are needed any quantity can be made in the above mentioned proportions. If the spray is to be applied to peach trees in foliage use the 3-6-50 formula.

These stock solutions can be kept for an indefinite time if water is added to replace that lost by evaporation. They should be kept covered to prevent dilution by rains. Made up

in this way each gallon of stock solution represents one pound of ingredients. Each should be stirred very thoroughly before any is taken out.

In making up the mixture from these stock solutions both the copper sulphate and the lime should be diluted before being mixed. Have two dilution barrels or tanks. If the 6-6-50 formula be used and the spray tank holds 100 gallons—take 12 gallons of copper sulphate stock solution and dilute to make 50 gallons in one barrel and take 12 gallons of the lime paste and dilute in the same manner in another barrel. The lime paste should be run through a fine strainer.

For convenience it is well to have a platform built high enough to permit the liquids to flow from the dilution tanks into the spray cart. Allow the two diluted solutions to run together through a 20-mesh copper wire strainer into the spray tank, mix well and apply at once.

It is always best before applying the mixture to test with potassium ferrocyanide.

Buy 10 cents' worth of potassium ferrocyanide at the druggist's and dissolve in the least possible amount of water. Label the bottle poison. Take out a cupful of the well-stirred mixture and allow a drop or two of the potassium ferrocyanide to drop into it. If the drop turns yellow or brown on striking the mixture it will be necessary to add more lime. Add lime till no discoloration is seen when tested in this way. If this precaution is not taken the spray may injure the foliage.

Use a good pump that gives strong constant pressure; have good nozzles that give a fine, mist-like spray and cover the tree thoroughly.

Always rinse the spray tank, hose and rod with water after using. Use only brass rods and connections as Bordeaux mixture will gradually attack iron.

Unfortunately, even the most carefully prepared Bordeaux will sometimes cause serious "russetting" of the fruit of apple. This russetting seems to be the most serious when rainy or at least humid weather prevails at the time of the first spraying after the blossoms fall, and as such conditions do usually thus prevail, at least in the Willamette Valley, "spray injury" following the use of Bordeaux often becomes almost as serious as the fungus injury it was expected to prevent.

SELF-BOILED LIME-SULPHUR.

This mixture, introduced and perfected by Scott, of the Department of Agriculture, is especially desirable for use on

peach foliage. The experience in most sections of the country has been that Bordeaux mixture and most other fungicides are unsafe to use on peach and other tender foliage. This fact has led to the perfection of the self-boiled lime-sulphur. This mixture, prepared and recommended for use on the peach foliage, is in effect a mechanical mixture of lime and sulphur with only a very small percentage of sulphides in solution. In Oregon this spray is especially recommended for use against brown rot and fruit spot of peach. The formula recommended is as follows:

Lime, 8 pounds;
Sulphur, 8 pounds;
Water, 50 gallons.

The preparation of the mixture as described by Scott in Bureau of Plant Industry Bulletin No. 174, is as follows:

"The mixture used in our experiments during the past season was composed of eight pounds of fresh stone lime and eight pounds of sulphur (either flowers or flour may be used) to 50 gallons of water. The mixture can best be prepared in rather large quantities, say enough for 200 gallons at a time, making the formula 32 pounds of lime and 32 pounds of sulphur, to be cooked with a small quantity of water (8 or 10 gallons) and then diluted to 200 gallons.

"The lime should be placed in a barrel and enough water poured on to almost cover it. As soon as the lime begins to slake the sulphur should be added after first running it through a sieve to break up the lumps. The mixture should be constantly stirred and more water added as needed to form a thick paste at first and then gradually a thin paste. The lime will supply enough heat to boil the mixture several minutes. As soon as it is well slaked water should be added to cool the mixture and prevent further cooking. It is then ready to be strained into the spray tank, diluted, and applied.

"The stage at which cold water should be poured on to stop the cooking varies with different limes. Some limes are so sluggish in slaking that it is difficult to obtain enough heat from them to cook the mixture at all, while other limes become intensely hot on slaking and care must be taken not to allow the boiling to proceed too far. If the mixture is allowed to remain hot 15 to 20 minutes after the slaking is completed, the sulphur gradually goes into solution, combining with the lime to form sulphids, which are injurious to peach foliage. It is therefore very important, especially with hot lime, to cool the mixture quickly by adding a few buckets of water

as soon as the lumps of lime have slaked down. The intense heat, violent boiling and constant stirring result in a uniform mixture of finely divided sulphur and lime, with only a very small percentage of the sulphur in solution. The mixture should be strained to take out the coarse particles of lime, but the sulphur should be carefully worked through the strainer.

"In applying the self-boiled lime-sulphur mixture, the spraying outfit should be equipped with a good agitator. The mixture settles to the bottom of the tank, and unless kept thoroughly agitated, cannot be evenly applied."

Since commercial lime-sulphur has caused some burning of fruit and foliage of the apple in some sections of the Northwest, we would suggest that the self-boiled lime-sulphur be tried for the third scab spray. Either the 8-8-50 or 10-10-50 formula may be used. While not as good as the commercial lime-sulphur against apple scab, Scott finds that it will control mild cases of scab, and in his experiments was entirely harmless to foliage and fruit.

Arsenate of lead for codling moth may be safely used with the self-boiled mixture in the same proportions as recommended when mixed with Bordeaux or commercial lime-sulphur.

LIME-SULPHUR SOLUTION.

It is often desirable and practicable to use sprays which combine both fungicidal and insecticidal qualities. The time, expense, and annoyance of one or more sprayings may frequently be eliminated by such combinations. Thus Bordeaux mixture and Paris green, or arsenate of lead, has long been used as a combined spray for apple-scab and codling moth and the expense of controlling these two important apple pests has thereby been materially reduced. This spray, however, combines only the fungicidal value of Bordeaux and the food poison value of the arsenical. It is of little or no value as a contact insecticide—in other words it is of no value against scale insects, plant lice and the numerous insects which belong to Group II.

During the past five years we have conclusively demonstrated that the lime-sulphur spray, which has long been known as the most satisfactory winter spray for San Jose scale, has fungicidal qualities nearly or quite equal to those of Bordeaux. We have also conclusively demonstrated that it may be used in combination with arsenate of lead without materially detracting from the value of either; and that when

so used it is at once an efficient contact insecticide, food poison spray, and fungicide.

It has also the advantage that when properly diluted it may be used either as a winter or summer spray.

As a winter spray one application of lime-sulphur spray each year will do more for the neglected orchard than can be done in any other way by the same expenditure of cash and energy. It not only destroys San Jose scale, but it also apparently destroys the branch form of woolly-aphis, the eggs of the green-aphis, the pear-leaf blister mite, the hibernating larvæ of the prune twig-miner, together with some other insects which may chance to be wintering upon the trees. It is also a good fungicide. If applied in fall it is nearly or quite equal to Bordeaux as a preventive of apple-tree anthracnose; applied to peach trees just before the buds open in spring it is a preventive of peach-leaf curl.

As a summer spray the results of the past five seasons' work at the Oregon Experiment Station prove conclusively that when properly diluted it can be safely used upon the apple, pear, plum and prune, potato, celery and other hardy plants, and that it gives better results in controlling apple scab than does Bordeaux, which has been the standard spray for this disease, and further that it does not produce the disastrous "spray injury" to the fruit which is so common and often serious when Bordeaux is used.

There are two methods of preparing the lime-sulphur spray. The formula which has been most generally used in this State is as follows:

Quick lime	50 pounds
Sulphur	50 pounds
Water	150 gallons

Slake the lime thoroughly, add the sulphur, and boil briskly for at least an hour or until the mixture is of a deep blood-red color with but little free sulphur on the surface. Add water to make 150 gallons. Apply with considerable force through a coarse nozzle.

The "stock solution" method which is now most generally used in this State has been developed during the past few years. During that time there have appeared upon the market a number of concentrated lime-sulphur solutions, which have only to be diluted with water to be ready for use. Careful experiments extending over three seasons have demonstrated that these sprays are fully equal to the old home-made lime-sulphur spray in destroying San Jose scale. Whether all of

them can safely be used for summer spraying is yet to be demonstrated.

The chief fault to be found with these commercial preparations is that they cost too much. The retail price is $9.00 to $12 per barrel of 50 gallons. The lime and sulphur necessary to prepare 50 gallons of stock solution which is equally as efficient costs at present retail prices approximately $3.00. It may be prepared as follows:

Sulphur (best finely ground) one sack....110 pounds
Lime (best grade, unslaked)..... 55 pounds
Water, sufficient to make..... 60 gallons

Slake the lime, mix the sulphur into a thin paste with a little water, add it to the lime, add sufficient water to make 60 gallons, bring to a boil and boil vigorously for 30 to 45 minutes. The sediment is then allowed to settle, after which the clear dark amber-colored liquid is drawn off and may be stored in sasks for future use.

Every grower who expects to prepare his own spray by the stock solution should provide himself with a Beaume's Acid Scale Hydrometer. Such an instrument, which should not cost over $1.00, furnishes a very simple and convenient method of testing the strength of the solution. A "stock" solution prepared as above described should test approximately 30 degrees upon such a scale.

If the grower be provided with a hydrometer, it is not at all necessary to obtain stock solutions of uniform strength. The following table gives the proper dilutions to be used with stock solutions of various degrees of density, both for winter and summer spraying:

Stock Solution Baume Scale—Deg.	*Dilution Winter Strength.*	*Dilution Summer Strength.*
32	1—12	1—32
31	1—11	1—31
30	1—10	1—30
29	1—9 ½	1—29
28	1—9	1—28
27	1—8 ½	1—27
26	1—8	1—26
25	1—7 ½	1—25
24	1—7	1—24
23	1—6 ½	1—23
22	1—6	1—22

KEROSENE EMULSION.

Kerosene oil, or coal oil, is a powerful insecticide. The undiluted oil is, however, liable to seriously injure plants to which it is applied. This difficulty is overcome by using one of the special spray pumps which have been devised for the purpose of mixing the oil with water in any desired proportion; or by forming an emulsion with some substance that may be readily diluted with water. Soap is most commonly used for this purpose, as follows:

Kerosene oil	2 gallons
Hard soap (preferably whale-oil)	½ pound
Water	1 gallon

Dissolve the soap in the water by boiling. Add the suds, boiling hot, to the oil. Churn the mixture violently with a spray pump until it becomes a thick, creamy mass. If perfectly emulsified, the oil will not rise to the surface even after standing an indefinite time. Such an emulsion may be used immediately or may be kept as a stock mixture. Before using dilute one part of the stock emulsion with 10 to 15 of water.

This will be found to be an efficient remedy for green aphis, woolly aphis, red spider, mealy bugs and certain scale insects.

CRUDE OIL EMULSION.

The crude oil emulsion spray is being used to some extent throughout the country for the San Jose and other scales, and directions for making are here included:

Fish-oil soap	5 pounds
Lye	1 pound
Crude oil	6 gallons
Water	43 gallons

This formula will make about 50 gallons of spray. Dissolve the soap in about 10 gallons of hot water, pour into a barrel or tank and add the rest of the 43 gallons of water, add the lye and pour the oil in slowly, agitating the liquid at the same time. *Never add more water after the oil has been poured into the mixing vessel.* Crude petroleum cannot at this time be sold under a strict guarantee as to specific gravity, but for this purpose should test from 15° to 20° Baumé.

WHALE-OIL SOAP AND QUASSIA.

Strong soapsuds made from any good soap are useful for destroying soft-bodied insects like plant-lice. It is usual,

however, to employ for this purpose special soaps made with fish-oils, and sold as whale-oil soaps. These vary considerably in composition, some being made with soda, others with potash lye. The latter are much superior and buyers should insist on having potash soaps.

For scale insects, whale-oil soap is sometimes used in as concentrated a solution as two pounds of soap to one gallon of water, but only upon dormant plants. As a remedy for the various plant-lice one pound of soap to eight or ten gallons of water is usually sufficient. Hop growers are inclined to believe that better results are obtained, when spraying for hop-lice, by adding some quassia decoction to the soap solution, as follows:

Whale-oil soap	10 pounds
Quassia	5 pounds
Water	100 gallons

Place the quassia chips in a sack, cover with eight or ten gallons of water and soak 12 to 24 hours. Then bring to a boil, remove the chips, add the soap and boil until it is dissolved. Add water to make 100 gallons. The whale-oil soap and quassia spray is used principally by hop growers.

BLACK LEAF-40.

Black leaf-40, a proprietary tobacco preparation, may be used for the same purpose as kerosene emulsion or whale-oil soap and quassia and has the advantage that it does not injure foliage and is ready for use. One gallon diluted with 800 to 1,000 gallons of water makes a very efficient aphidicide.

WHEN TO SPRAY.

General directions as to how many times to spray and when the applications should be made are at best unsatisfactory. The answer to both questions depends not only upon the variety of fruit to be sprayed, but also upon the conditions prevailing in the orchard to be sprayed, and the relative importance of the orchard crop to other crops. The orchardist can afford to do more spraying than can the farmer.

An almost universal practice in this State—and a good one—is to spray the orchard, whatever the kind of fruit, with lime-sulphur at some time while the trees are dormant. While this application is made primarily for San Jose scale, I believe there is no other which has such a generally beneficial result. It is the annual "house-cleaning" of the orchards.

The best time for this winter spraying is immediately after the leaves drop in fall—even before they are all off—or just before the buds open in spring. Personally, I prefer the latter, but attention should be called to the danger of unfavorable weather conditions at that time and to the consequent inadvisability of delaying the work too long.

All other sprayings are for special purposes and can best be considered in connection with particular pests.

APPLE.

APPLE SCAB.

Spray with Bordeaux or with lime-sulphur (1-30): first, when the blossoms are beginning to unfold; second, spray with lime-sulphur (1-32) immediately after the blossoms fall; third, repeat 10 days or two weeks later. If prolonged rainy weather follows the third spraying, a fourth two weeks later may be profitable.

CODLING MOTH.

Add arsenate of lead or Paris green to the second scab spray. Endeavor at this time, by the most thorough work, to fill the blossom end of every apple with the spray. If this be well done, and if the fruit be again thoroughly sprayed late in June, fairly good results may be obtained without further applications. It is our experience, however, that in the Willamette Valley at least, it usually pays to spray once or twice for the second brood. The first of these applications should be about August 1; the second some three or four weeks later. While thorough work should be done at all times particular emphasis should be placed upon the first two sprayings. If all of the first brood larvæ could be killed there would be none of the second.

SAN JOSE SCALE.

Spray in winter with lime-sulphur, either immediately after the leaves fall or before the buds start in spring. Do thorough work. Soak every part of the tree.

APHIDS OR PLANT LICE.

GENERAL RECOMMENDATIONS.

To destroy stem-mothers in the spring, spray just as the buds are opening with lime-sulphur (1-10) plus black leaf-40

(1-900), or black leaf-40 (1-900), or kerosene emulsion 15 per cent solution, or whale-oil soap two pounds to four gallons of water, if none of the other sprays can be secured. This applies to all fruit trees and bush fruits.

To destroy the lice after the foliage is out, spray with black leaf-40 (1-900) plus one pound of soap to each 100 gallons of spray, or kerosene emulsion 15 per cent solution, or whale-oil soap two pounds to four gallons of water.

APPLE TINGIS.

Practice clean culture, clean up and burn all rubbish about the orchard. Spray when eggs are hatching in late May or early June with kerosene emulsion or black leaf-40.

APPLE TREE ANTHRACNOSE.

In orchards where slightly affected with anthracnose or where it is considered advisable to spray as a matter of general orchard practice, it is advised to spray once in the fall, as soon as possible after the fruit is picked, using Bordeaux mixture, 6-6-50.

In orchards where the disease is on the increase and it is desired to make a special effort to prevent any further spread, growers should spray twice with Bordeaux mixture (6-6-50) after the fruit is picked. The two applications should be about two or three weeks apart.

Where the disease is abundant and is seriously interfering with the growth and productiveness of the orchard, and it is desired to clean up the orchard in the shortest time possible, then it is advised to spray at least once before the fruit is picked with Bordeaux mixture, 4-4-50. This application should be made about the middle of September or before the first fall rains. In addition, such an orchard should be sprayed twice with Bordeaux, using the 6-6-50 formula as recommended above.

CHERRY.

SHOT-HOLE FUNGUS.

Spray with Bordeaux or lime-sulphur when blossoms are opening, and again when petals have fallen.

CHERRY SLUGS.

Spray with white hellebore or arsenate of lead whenever they become troublesome.

ROSY APPLE APHIS.

See under "Apple."

SAN JOSE SCALE.

See under "Apple."

CHERRY GUMMOSIS.

See article on this disease in the biennial report of Crop Pest and Horticultural Investigations issued by the Oregon Agricultural Experiment Station at Corvallis. A copy will be sent on request to the secretary.

BROWN ROT.

See under "Peach."

PEACH.

PEACH LEAF CURL.

Spray thoroughly before buds open with Bordeaux or lime-sulphur.

PEACH BLIGHT.

Spray with Bordeaux soon after fall rains begin or immediately after late fruit is gathered.

PEACH FRUIT SPOT.

Spray same as for blight. Also spray once or twice in late May and early June with self-boiled lime-sulphur. Do not make these applications during rainy weather.

BROWN ROT.

Destroy all rotting fruit. Spray three or four weeks after the petals fall with 8-8-50 self-boiled lime-sulphur. Repeat three weeks later. One month before the fruit is expected to ripen make a third application, using the same mixture.

SAN JOSE SCALE.

See under "Apple."

PEAR.

PEAR SCAB.

See under "Apple Scab."

CODLING MOTH.

See under "Apple."

SAN JOSE SCALE.

See under "Apple."

PEAR SLUG.

See under "Cherry Slug."

FIRE BLIGHT.

This is the most destructive disease of the pear; it also attacks the apple and other related trees. Extreme care and thoroughness are necessary in dealing with this disease. Fire blight can be controlled only by cutting out all diseased tissue as soon as detected and burning it. Special attention should be given to the prevention of the formation of any "hold-over" cankers. If such are formed they must be removed before the trees blossom the following spring. Examine not only branches but trunk, and even roots. Sterilize tools and wounds made in cutting and the disease frequently with solution of corrosive sublimate.

PEAR-LEAF BLISTER MITE.

Spray with lime-sulphur just as buds are starting.

PLUM AND PRUNE.

BROWN ROT.

See under "Peach."

SHOT-HOLE FUNGUS.

See under "Cherry."

SAN JOSE SCALE.

See under "Apple."

NOTE.—Nearly all the above mentioned diseases and insect pests, together with many others, are fully discussed and remedies given in the reports of the departments of plant pathology and entomology which appear in the biennial Report of Crop Pest and Horticultural Investigations issued by the Oregon Agricultural College Experiment Station at Corvallis, Oregon. A copy will be sent to any resident of the State who makes application to the secretary.

APPENDIX

PREVENTING INJURY FROM LATE SPRING FROST BY SMUDGING.

By A. H. CARSON, *Commissioner of the State Board of Horticulture, Third District.*

There are a few fruit-growers yet who have not faith that fruit can be saved from a late spring frost during the blooming period by building fires in the orchard during cold nights.

The success had in and about Medford, Grants Pass and Roseburg the past three seasons by fruit-growers in using smudge-pots to save their fruit from frost has been so sure that one without faith in their virtue should surely become convinced by this time. In all cases where the grower has used the smudge-pot, and fired his orchard at these places he has prevented injury and had a crop, while his neighbor without faith or who has neglected to smudge has had severe losses from freezing.

The writer has had some experience in smudging on frosty nights, and it is my purpose in this article to give that experience and observation had during the spring of 1887. In 1885 I had several acres in peaches that bloomed heavily, and during the latter part of April of that year, after the young peaches had shed the calyx, a heavy freeze occurred on April 28th, and every peach in the orchard was frozen.

In 1886 the same climatic conditions existed, and again I lost all my peaches, on the morning of May 2nd, that year. This was discouraging—my year's labor with this fine young orchard blighted in a night by frost. I resolved that the next year, 1887, if my peach trees bloomed and it proved a frosty spring, to try and save the crop by smudging. This was long before oil-pots were thought of.

In the spring of 1887 my peach trees bloomed freely as well as early, I having made a record for that year of noting the first bloom on March 10th. This was a frosty year, and I got ready to smudge my peach orchard by getting up pitch wood, hauling coarse barnyard litter into the orchard, and saving the prunings from the orchard in case I had to fire. During March, after I noted the first bloom, the month remained moist and warm, and these conditions continued until the 10th of April, when it cleared up with the wind in the north-west, promising a sharp frost that night. I was prepared to smudge. I set the alarm clock for 2 a. m. and at that time went out to note weather conditions and the temperature given by several thermometers I had in various parts of the orchard. On the lowest level in the orchard I found the temperature to be 33 degrees, while one thermometer, about 100 feet higher, recorded at that hour 34 degrees. This was getting to a very dangerous temperature, as ice forms at 32 degrees. I carefully watched the thermometer for quite a while, and noted that it did not rise or fall, but seemed to be on a stand. I walked from this thermometer to the one on the lower level and read it. I noticed it had gone up a shade since first reading it at 2 a. m. The mercury rising at this time indicated a change, although the stars overhead, and in the east were

Children at Work in a Portland School Garden.

brilliant. I set down my lantern and walked out to take a look at the horizon in the west. I could see no stars in the west lower than about 10 degrees above the horizon and returned to the thermometer and found it slowly rising. I did not call the men, but watched the thermometers, and they continued to rise until 4:30 a. m.; the lower thermometer read 35 and the upper one 36 degrees. At this hour all stars were obstructed from view to about 45 degrees above the horizon, while overhead, and in the east, they continued bright. This fog coming from the west, and gradually rising stopped heat radiation, hence I had no occasion for smudging that night. From April 10th until the morning of May 1st I was up at 2 a. m. fifteen times, watching weather conditions to determine whether I should smudge. On the morning of April 16th at 2 a. m. the lower thermometer read 35 degrees and the upper one 36, and was slowly falling. I noted the conditions in the west, and every star was shinging brightly down to the horizon. The mercury by 4 a. m. was down to 33 degrees, and no change indicated in the west. I called the men and we started our fires at once. It continued clear until the sun came up. At sunrise the thermometer registered 28 degrees. Not a peach was injured by this cold, although it was four degrees below 32 when ice begins to form. On April 22nd the same conditions as to frost occurred, and we had to build our fires again, and we saved our peach crop from a killing frost. On the night of April 30th, there was every indication of a killing frost. At 2 a. m. I was up, and noted the reading of the two thermometers. The degrees of cold read 33 and 34 and no indication of a fog in the western horizon. I at once called the men, and we started our fires. The mercury continued to fall until sunrise, when the thermometers read 27 at the lower level and 28 at the upper. We kept the fires going vigorously until the temperature rose just after sunrise to above 32. We examined the young peaches on the trees after the sun came out, and not a peach we could find had been injured within the zone of smoke. Off from the main orchard we had a few young trees we did not smudge that were bearing a number of peaches; all these were killed. Not a peach there but that turned black and fell off.

The strongest evidence that smudging our peach orchard that year (1887) saved our peach crop was that we were the only peach-growers in Josephine County that marketed peaches. All the peaches in the county except ours, were killed on the nights of April 16th, 22nd and 30th. We had to thin our crop, while our neighbors had no peaches to thin. Of the fifteen nights I was up at 2 a. m., at 9 p. m. it was cold, still and clear, and no doubt had the dew-point been taken with the wet and dry-bulb thermometers, frost warnings would have been given and the growers in case there was no change during the night could start their smudges. However, the point I desire to impress on the minds of the fruit-growers that are prepared to smudge is that in many cases where the warnings are sent out from a central station to expect frost towards morning a change may occur, and the necessity for smudging not exist. It is unsafe not to heed the warnings sent out from a central warning station, where the operator is equipped with wet and dry-bulb thermometers, but it is also poor economy for the fruit-grower not to be out of bed at 2 a. m. and note if a change is occurring or not. I say it is poor economy for the grower to depend altogether on these warnings without being up, for should a change occur and he was burning oil before the cold had been severe enough to damage his fruit, it would be an unnecessary expense. Of the fifteen nights in 1887 I was up to note weather conditions, only three did I have to smudge, although twelve of the nights at sunset indicated severe and damaging frost, had not the changes occurred towards morning.

Owing to the topography of the country and air currents a damaging frost may occur in one locality, while but a short distance away no damage is done by reason of favorable air currents that drive the warm air to this favored section. These warm air currents are variable; one night they may favor a given locality, and another frosty night some other. Hence, it would be unwise for the fruit-grower to rely on these warm belts without being up to note the degree of temperature of his locality from his thermometer.

During thirty-eight years I have lived in Josephine County, engaged in fruit-growing, I have known of severe damage done the fruit in Jackson County, and Josephine County have no damage whatever; then other years Josephine County has had nearly all her fruit killed by frost, and Jackson County have no damage done from a like cause.

If one notes carefully his thermometer on a frosty night, and no change occurs, there is no necessity for starting the oil pots, until near 32 degrees of cold; hence by careful watching of temperature while smudging, one can save much oil. However, care should be taken to have the oil pots fired before the temperature falls to 32 degrees, and the smudges active.

During my experience of smudging in 1887 I was unable to see that my fires raised the temperature, but the smoke circulated in large quantities through the trees, and no doubt had I thought to have taken the temperature up in the tree tops I would have noticed a higher temperature. I had my thermometers hanging on the lower limbs where they did not get the heat which no doubt was greater where the heavy volumes of smoke circulated.

GROWING PRUNES IN THE WILLAMETTE VALLEY.

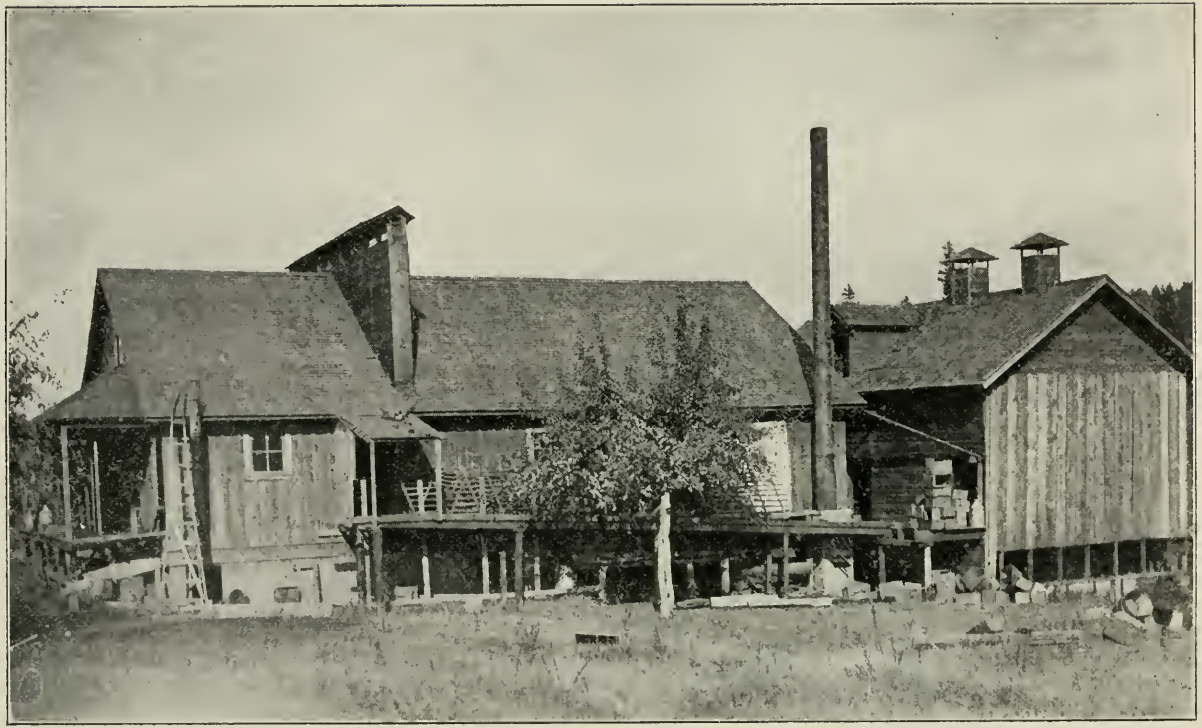
By A. C. GOODRICH, *Commissioner of the State Board of Horticulture for the First District.*

In discussing the prune in the Willamette Valley there is only one variety, the Italian, to be taken into consideration. In the earlier days of prune-planting the different varieties were all tried, and to that fact may be attributed many of the earlier failures. In the first plantings there were perhaps quite as many of the Petite or French prunes planted as of the Italian variety and as it later developed that this variety was not at all suited to our conditions, however well it might be to those of our neighbor State of California, half our first orchards were from the very beginning doomed to be failures. Then, when we consider the fact that we had no data on which to base correct judgment as to what soil would be best for them, at what elevation they should be planted, how far apart, how they should be pruned or cultivated, how cured or how marketed, the really surprising fact is that all are now agreed as to the one variety to grow, most are agreed on all the other essential facts, including that hardest one of all, marketing.

In spite of all these adverse conditions and the fact that the apple grows in the Willamette Valley with the same abandon that weeds grow in a well fertilized garden, the prune, in only about a quarter of a century, has reached first place as a market fruit and bids fair to maintain its position, in spite of the fact that for some years the major portion of the tracts cut up by real estate dealers into small parcels and sold to non-residents have been planted to other fruits.

While the planting of prunes has of late years not been so general as the planting of walnuts and apples, they have, in the main, been planted by men who know what they are doing and how to do it, or by their neighbors who learn how, largely by profiting by the experience of those already in the business. Because of these conditions and the close personal attention they are likely to receive there will probably be a much larger proportion of the prune-plantings reach profitable maturity than there is likely to be of any of the other fruits or of nuts.

At first the prune trees were planted much too close together; one orchard I have seen being only eight feet apart, though most of them were planted 16 to 18 feet. The net result of this was that in a comparatively short time the ground was full of prune roots—in fact long before the trees came into profitable bearing, and the plant food available in the soil was so far exhausted that the trees only bore alternate years, or the fruit was so small as to be not only largely unprofitable to the grower, but a menace to the market of the future, for the Italian prune, like the Hood River and the Rogue River apple depends for its most profitable market on the high quality of the output. The distance between the trees has been gradually widened until now most orchards are set twenty-four feet or more apart, and the fact that in digging a ditch last winter eighteen feet from a seven-year-old prune tree I found a root as large as a lead pencil, leads me to believe that in the near future we are likely to be setting them thirty or more feet apart.



Prune-Dryer on Willamette Valley Farm.

As a crop of fifteen tons of green prunes, while above the average is not at all uncommon, it can easily be seen that the soil that grows them must be very fertile in the first place and well and regularly fertilized or it will soon be producing small unprofitable fruit.

In planting prunes the ground should be well and deeply plowed in the fall or early winter, preferably after having plowed under a crop of clover or vetch the preceding summer, and left rough till the following spring. At any time after the trees are entirely dormant they may be dug and set in the orchard whenever the ground is in fit condition to be worked. On very loose soil it is, perhaps, better to set as early as possible, so that the dirt will settle well around the roots before the dry weather comes, while in more compact soils, later will probably do quite as well so the soil will not pack too tight about the roots, thus increasing the work of cultivation. As early as the soil is in right condition to be worked, and it should never be touched while wet, the top should be broken down with the harrow and worked from that time until the latter part of July so as to keep it finely pulverized on top to retain the moisture. If any crop at all is grown between the trees it should be one that can be "laid by" in time for the trees to harden up the wood so as to be ready for the winter; otherwise, there may be serious injury from early frosty weather. It is hard to recommend any crop for growing between the trees as the crop must be one that can be profitably used or one that can be readily marketed at a profit. Hay or grain is not to be considered if one expects to give the trees the care they should have. Personally, I consider potatoes very objectionable, on account of the great amount of potash they remove from the soil. While our agricultural chemists tell us that our soil is very rich in potash, having enough to grow wheat for two hundred years, one only has to look at the spot where a brush pile has been burned and compare the growth of vegetation on it with that on the surrounding ground to realize that there is none too much of it available. If cows are kept—and cows and orchard make a splendid combination—and the soil is sufficiently rich to make it worth while, corn may be grown for ensilage and the fertility returned to the land in as readily available form as it was before. Possibly cabbage may be profitably grown if the soil is rich enough and there is a good market near. Beans can be grown with benefit to the land, rather than injury; though they are seldom very profitable.

Just as the buds begin to swell the trees should be headed to the desired height and on this point there is some divergence of opinion, the usual height being from twenty-four to thirty-six inches high. After the leaves have started all should be stripped off to within about a foot of the top and the following winter all of these but three should be cut back to within four to six inches of the trunk and these should be distributed as nearly even as possible around the tree and at some little distance apart so that as the trees grow older they may not be too near together. The following year all limbs growing from these should be cut off except not to exceed three on each primary branch and these should be cut back to fourteen to sixteen inches. The prune tree should always be cut to inner or upper bud as it has the habit of drooping with the weight of fruit and if the branches come from the lower side they will usually soon droop so they are in the way of cultivation.

Four-Year-Old Anjou Pear Trees—Southern Oregon.

GROWTH OF THE FRUIT INDUSTRY IN OREGON IN THE LAST DECADE.

By H. M. Williamson, *Secretary of State Board of Horticulture.*

The figures of the United States census of the year 1910 are not all available yet, but the more important items have been published. The following table shows the population of Oregon; the number of farms in the State and the amount of production of various crops of the State as shown by the censuses of 1900 and 1910, with the percentages of increase in each case. The crop year covered by the 1900 census was that of 1899, and the crop year covered by the census of 1910 was that of 1909:

	Census 1900	*Census 1910*	*Per cent increase*
Total population	413,536	672,765	62.7
Whole number of farms	35,837	45,502	27
Dozens of eggs produced	7,709,970	11,140,624	54.4
Bushels of all grains grown	23,225,515	26,343,230	13.4
Pounds of butter produced	10,082,807	14,140,624	40.2
Tons of hay produced	1,117,400	1,587,796	42.1
Bushels of potatoes produced	3,761,367	4,822,962	28.2
Bushels of apples produced	873,980	1,930,926	132
Bushels of pears produced	112,225	374,620	234
Bushels of peaches produced	101,190	179,030	77
Bushels of cherries produced	65,347	181,089	175
Bushels of plums and prunes produced	359,821	1,747,587	385
Bushels of apricots produced	1,665	4,618	177
Bushels of quinces (estimated)	3,000	5,344	
Total bushels of fruit	1,517,228	4,423,214	190

In the 1900 census the value of all tree fruits are grouped in the published returns. In the 1910 census the values of each of the leading kinds of fruits are given. The value of the apricots and quinces grown in 1909 are not yet available but if we estimate the total value of the 4,618 bushels of apricots and 5,344 bushels of quinces grown in 1909 at $10,000 then the total value of all the tree fruits grown in Oregon in 1909 was $3,337,717. For the year 1899 the value of all tree fruits grown in Oregon was $906,015. The increase in value for the decade was 268 per cent, as compared with an increase of 190 per cent in the quantity of fruit produced.

It will be observed that the percentage of increase in the quantity of all tree fruits produced in Oregon was approximately seven times as large as the percentage of increase in the number of farms in the State; four and one-half times as large as the percentage of increase in the production of hay; fifteen times as large as the percentage of increase in the production of grain; and nearly seven times as large as the percentage of increase in the production of potatoes.

Of those states which in 1909 each produced more than 100,000 bushels of cherries, Oregon made the highest percentage of increase for the decade.

Of the ten states which each produced more than 100,000 bushels of plums and prunes in 1909, Oregon made the highest percentage of increase for the decade.

Of the ten states which each produced more than 100,000 bushels of pears in 1909, Oregon ranked third in percentage of increase.

Of the 29 states which each produced more than 1,000,000 bushels of apples in 1909, Oregon ranked sixth in percentage of increase, the states which ranked higher in their order beginning with the highest, being Colorado, Minnesota, Wisconsin, Washington and Nebraska.

In rank among the states of the Union as to number of farms, Oregon had 33rd place in 1900, but fell to 34th place in 1910.

In production of plums and prunes it had second place in 1899 and held the same place in 1909.

In production of apples it advanced from 25th place in 1899 to 22nd place in 1909.

In production of pears it advanced from 12th place in 1899 to 6th place in 1909.

In production of cherries it advanced from 12th place in 1899 to 10th place in 1909.

In the census of 1900 all trees were counted together whether of bearing age or not. In 1910 the trees of bearing age and those not of bearing age were reported separately. The figures now available for plum and prune and cherry trees in 1910 are the whole number and not the number of the bearing and of the non-bearing trees separately. The published data available for the 1900 census gives the numbers in most cases in round thousands. The numbers for 1900 and 1910 follow:

	Whole number 1900	No. bearing 1910	Number not bearing 1910	Whole number 1910
Apple	2,825,898	2,029,913	2,240,636	4,270,549
Plum and prune	2,517,523	1,764,896	427,609	2,192,505
Pear	374,165	273,542	795,699	1,069,241
Cherry	237,155	223,456	313,770	537,226
Peach	281,716	273,000	508,000	781,000
Totals	6,236,457	4,564,969	4,285,893	8,850,862

We find that the whole number of bearing trees in Oregon of the tree fruits mentioned in the foregoing table in 1910 was 1,771,486 less than the whole number of trees of all ages in 1900. There were 4,285,893 trees in 1900 that had not yet reached bearing age. This indicates an annual yearly planting of more than 600,000 trees in Oregon, and that at least 1,800,000 trees planted after 1900 should have come into bearing in 1910 if they survived until that time. After allowing that one-third of this number died after they were planted from natural causes or through the will of the owner, the conclusion is inevitable that at least 2,870,000 of the fruit trees of Oregon which were in existence in 1900 were not in existence in 1910. A comparison of these figures with those of adjoining states shows that this great mortality was not the result of natural causes, and that the great fatality was the result of the activities of the State Board of Horticulture in bringing about the abatement of neglected, pest-ridden trees

and orchards in the State which had become a public nuisance and a great drag upon the development of the fruit-growing industry of the State. Owing to the great planting of apple orchards in Oregon in the gold-mining days when apple-growing was extremely profitable, and the fact that for many years the production of apples in this State was many times as great as was required to supply all markets which could then be reached, the Willamette Valley contained a great acreage of long-neglected and worthless orchards. In no other portion of the State was there so much to be done in the way of getting neglected orchards cleaned up or destroyed. The work has not been completed, and the census figures of 1910 as to number of trees by counties are not yet at hand, but it is probable that at least one-half of all the trees which went out of existence for the benefit of their owners and the public generally in the last decade were in the Willamette Valley. The beneficial effects of their destruction are plainly seen in the remarkable growth of production of tree fruits in the last decade, as shown by the census reports giving the aggregate yield in bushels of apples, plums and prunes, pears, peaches and cherries in the counties which lie in the Willamette Valley for the crop years of 1899 and 1909:

	Bushels 1899	Bushels 1909	Percent increase
Clackamas	50,132	331,411	565
Marion	65,887	674,598	923
Linn	60,285	193,887	221
Lane	63,851	196,051	206
Benton	35,853	111,257	210
Polk	33,682	237,932	666
Yamhill	114,319	521,932	356
Washington	57,538	249,349	333
Totals	481,546	2,516,417	422

This shows that the percentage of increase of production of tree fruits in the Willamette Valley for the decade was more than double that of the State as a whole. A large share of this great increase in the Willamette Valley was due to prunes. The prune orchards were yet young in 1900 and most of them had not then come into full bearing. With apples it was different. There were almost no young apple orchards in the valley in 1900. The yield of apples had been decreasing for nearly twenty years and in 1899 the yield for the whole valley was only 310,000 bushels from more than 1,500,000 trees. There was at that time a general feeling of discouragement and hopelessness about the apple industry in the Willamette Valley. With the destruction of a great share of the worthless trees and better care of what were left apple production made an excellent start upwards again during the decade as shown by the following table giving the yields of apples for the valley counties for 1899 and 1909:

County—	Apples Bushels 1899	Apples Bushels 1909
Clackamas	26,369	144,329
Marion	33,815	153,183
Linn	48,461	95,993
Lane	46,428	98,157
Benton	32,381	54,748
Polk	27,224	70,408
Washington	38,300	92,843
Yamhill	57,739	89,292
Total	310,717	798,953

It will be seen that the percentage of increase for the valley for the decade was 157 per cent, as compared with an increase of 132 per cent for the State as a whole. The Oregon Agricultural College deserves much credit for the part it has done in bringing about better care of the orchards.

SMALL FRUITS.

Complete statistics from the 1910 census as to small fruits are not yet available. The following was the production in quarts of the principal small fruits in the crop years of 1899 and 1909:

	Quarts, 1899	Quarts, 1909
Strawberries	3,837,820	5,322,040
Gooseberries	326,780	307,395
Raspberries and loganberries	783,060	2,644,948
Currants	238,420	117,354
Blackberries and dewberries	1,310,920	915,744
All small fruits	6,497,000	9,307,481

The value of the crop of small fruits for 188 was $386,632. The figures for 1909 are not available, but as prices were materially higher in 1909 than in 1899 the value of the crop of 1909 probably exceeded $800,000.

The crop of grapes decreased from 5,389,000 pounds valued at $162,543 in 1899 to 3,207,000 pounds valued at $99,000 in 1909. The decrease in this industry has been due to the low average of prices for grapes which have prevailed in Oregon during the greater part of the decade.

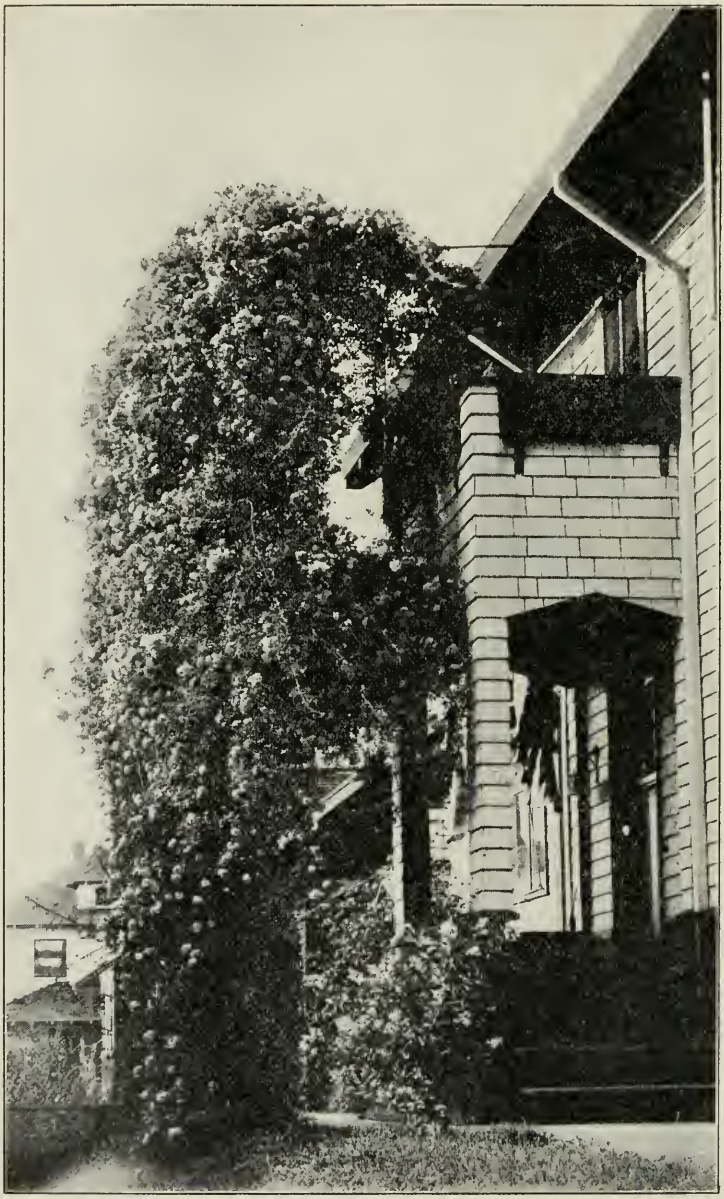
CLIMATIC CONDITIONS IN OREGON.

By H. M. WILLIAMSON, *Secretary of State Board of Horticulture.*

(All figures relating to temperature and rainfall, and most of those giving elevations in this article are from the publications of the Oregon Section of the Climatological Service of the Weather Bureau of the U. S. Department of Agriculture, Edward A. Beals, district forecaster and section director, Portland, Oregon. For fuller details as to climatic conditions in this State, address Oregon Section, U. S. Weather Bureau, Portland, Oregon.)

From the nature of a large number of inquiries which come to the office of the State Board of Horticulture, it is apparent that many persons who live east of the Rocky Mountains have a very vague understanding of climatic conditions in Oregon. The question most commonly asked is "What is the average temperature and average rainfall in Oregon?" It is easy to answer this question by giving the normal average temperature for all observation stations in the State, which is 50.2 degrees, and the average annual rainfall for all the stations which is 38.71 inches. This reply would be worse than valueless to a person intending to settle at Burns where the annual temperature is 43.7 degrees, and the annual rainfall is 10.58 inches. The annual temperature also lacks much of being a reliable indicator of summer and winter temperatures. The average annual temperature at Marshfield, Oregon, is 49.4 degrees; at Heppner, 50.2 degrees, a difference of only .8 of a degree. The temperature of January at Marshfield is 44.7 degrees; at Heppner, 32.9 degrees. The temperature of July at Marshfield is 59.4 degrees; at Heppner, 68.8 degrees. The annual temperature at Marshfield is seven degrees warmer than it is at Joseph, but the months of June, July and August are all warmer at Joseph than at Marshfield.

The person who has always lived in regions where there are but slight differences of elevation above sea level, or which are remote from an ocean, find it hard to understand climatic conditions in Oregon. Except as modified by mountain ranges, the elevation of the State tends to increase towards the south, and we find that the highest annual temperature at any station is at Blalock on the northern boundary of the State. The ocean profoundly affects the climate by making the winters warmer and the summers cooler. The remarkably small difference between the temperatures for January and for July at Marshfield is due to the fact that Marshfield is but a few miles from the ocean. The modifying effect of the ocean is disturbed by ranges of mountains which interfere with and deflect the currents of air from the ocean, as they pass towards the interior. The Coast Range and Cascade Mountains also greatly affect the rainfall in the different portions of the State. The chilling of the air as it rises over the mountains forces out moisture. The loftier the mountains and the lower the temperature reached by the air the less moisture remains in it. It is generally the case that in any given section rainfall increases with altitude, although not necessarily in the same proportion. It is the



A Climbing Rose in Portland—Courtesy of W. D. Trotter.

case throughout Oregon and on the Pacific Coast generally that there is very little rain in summer and that most of the precipitation for the year comes in the winter months. The proportion of sunshine is larger east of the Cascade Mountains than west of those mountains, but even in western Oregon there is more sunshine in summer than in the states on the Atlantic Coast. Throughout the State there is much less wind during the year than in the prairie states of the middle west and for this reason there is much less evaporation of moisture from the surface of the soil.

The lofty range of the Cascade Mountains which extends throughout the State from north to south divides the State into two sections which differ widely. In the greater part of western Oregon the annual rainfall is ample for the production of good crops of all fruits without the aid of artificial irrigation. The exception to this is that portion of western Oregon commonly referred to as southern Oregon, or the Rogue River valley, where irrigation is essential for the best results on much of the land. In eastern Oregon the annual rainfall averages less than one-fourth as much as in western Oregon. The largest rainfall at any station east of the Cascade Mountains at which observations have been made for a considerable period of time has been recorded at Hood River where it amounts to about 36 inches, closely approaching that of some portions of the Willamette Valley in western Oregon. The Hood River Valley, however, is not far east of the summit of the Cascade Mountains, and the rainfall decreases rapidly to the eastward. Under favorable conditions there are successful orchards which are not artificially irrigated in a number of localities in eastern Oregon, even where, in some cases, the annual rainfall is as low as 16 inches per year, but the general rule in that portion of the State is that artificial irrigation is essential to success in orcharding, and even at Hood River where the annual rainfall exceeds 35 inches per year many of the orchardists believe it pays to irrigate their orchards. Stone fruits, particularly cherries, peaches, apricots and some varieties of plums can be grown with less annual rainfall than is required for apples, and most kinds of small fruits require even more rainfall than apples.

In this article the word rainfall is used to include the total amount of water which falls whether it comes in the form of rain or of snow.

COUNTY CONDITIONS.

The natural order of taking up counties for the purpose of giving figures as to rainfall and temperature would be by groups of those having like conditions but it is believed that it will best suit the convenience of inquirers to take up the counties alphabetically.

BAKER COUNTY.

Baker County is on the eastern border of the State, and on the eastern slope of the Blue Mountains. At Baker, the county seat, the elevation is 3,466 feet. The mean temperature for the year is about 45 degrees. Three years observations show the temperature of January to be 20.3 degrees; April, 44.6; July, 66.9; October, 48.5. The rainfall for the year is 13.7 inches. The growing season between killing frosts is about 134 days. At Huntington, on the Snake River, the elevation is 2,165 feet. The anuual temperature is 53.6 degrees; that of January, 32.1; April, 58.6; July, 81.5; October, 51.8. The length of season between killing frosts is about 168 days, or about the same as at Burlington, Iowa, Indianapolis, Indiana, and Roanoke, Virginia. At

Four-Year-Old Yellow Newtown Apple Trees—Rogue River Valley.

Sparta the elevation is 4,150 feet; the annual temperature, 45.3 degrees, and the annual rainfall is 22.74 inches.

BENTON COUNTY.

Benton County is in the heart of the Willamette Valley and extends from the Willamette River into the Coast Range Mountains. The elevation at Corvallis, the county seat, is 266 feet. The annual temperature is 51.7 degrees; that of January, 39.1; April, 50.1; July, 65.3; October, 52.6. The annual rainfall is 43.32 inches. At Monroe the elevation is 350 feet. The annual temperature is 52.2 degrees; that of January, 39.8; April, 50.5; July, 65.3; October, 53.4. The average period between killing frosts is 197 days, or about the same as at Richmond, Virginia. The annual rainfall is 52.2 inches.

CLATSOP COUNTY.

Clatsop County is in the northwest corner of the State. Much of the county is hilly or mountainous, but there is also a considerable amount of low-lying land. Astoria, the county seat, is on the Columbia River, 10 miles from the ocean. The elevation of the station is 16 feet. The annual temperature is 51.8 degrees; that of January, 39.9; April, 49.7; July, 61.6; October, 53.2. The average season between killing frosts is 271 days, or about the same as at Mobile, Alabama. The annual rainfall is 73.49 inches.

CLACKAMAS COUNTY.

Clackamas County is in the Willamette Valley but extends from the Willamette River to the summit of the Cascade range of mountains. The observation stations represent fairly only the lower-lying sections of the arable lands of the county. At Miramonte farm, near Aurora, the elevation is 195 feet. The annual temperature is 51.5 degrees; that for January, 38.5; April, 50.6; July, 65.2; October, 52.6. The annual rainfall is 43.52 inches. At Stafford, in the western part of the county, the elevation is 400 feet. The temperature is about the same as at Miramonte farm, but the annual rainfall is 51.66 inches. Cazadero is in a narrow valley in the foot-hill portion of the county, and is at an elevation of 503 feet, but most of the adjacent arable lands are at elevations of from 900 to 1,500 feet. The annual temperature for 1911 was 51.5 degrees. At Pompeii (Rowe P. O.) in the heart of the Cascade Mountains, the elevation is 3,879 feet; the annual temperature is 43.7 degrees. The period between killing frosts is about 84 days. The annual rainfall is 85.46 inches.

COLUMBIA COUNTY.

Columbia County is in the northwestern portion of the State and contains some low-lying land along the Columbia River, but the general elevation of the county is above 1,000 feet. At Doraville, near Rainier, the annual temperature is 49.6 degrees; that of January, 36.2; April, 44.5; July, 62.5; October, 53.4. The annual rainfall is 51.74 inches.

COOS COUNTY.

Coos County is in the southwestern portion of the State fronting on the ocean. The observation stations represent the low-lying valleys which are now utilized. Much land at higher levels will in time come

under cultivation. Marshfield, the county seat, is on Coos Bay and near the ocean. The elevation of the station is 34 feet. The annual temperature is 49.4 degrees; that of January, 44.7; April, 50.4; July, 59.4; October, 54.8. Much of the valley lands of the county are protected from ocean air by intervening ridges and have a warmer summer than Marshfield. At Fairview the elevation is 142 feet; annual temperature, 52.4 degrees; January, 44.4; April, 50.3; July, 61.4; October, 52.2; annual rainfall, 69.48 inches.

CROOK COUNTY.

Crook is one of a number of very large counties in Oregon. It is in the central portion of the State, east of the Cascade Mountains. Prineville, the county seat, is at an elevation of 2,864 feet. The annual temperature is 47.5 degrees; January, 33.2; April, 46.5; July, 66.2; October, 49.9. The average period between killing frosts is 112 days. The annual rainfall is 9.16 inches. The elevation at Bend is 3,629 feet; annual temperature, 44.8 degrees; January, 30.9; April, 43.4; July, 62.7; October, 49.3; annual rainfall, 16.03 inches. At Warmspring the elevation is 1,600 feet; annual temperature, 50.7 degrees; January, 32.8; April, 49.9; July, 69.9; October, 51.7; annual rainfall, 11.47 inches.

CURRY COUNTY.

Curry is in the southwestern corner of the State and a large portion of the county is mountainous. At Port Orford on the Coast the annual temperature for 1911 was 50.3 degrees; January, 43.7; April, 47; July, 57.6; October, 54.2. The rainfall for the year was 56.41 inches. At Gold Beach, on the Coast, the annual temperature is 50.5 degrees; February, 46.7; May, 53; August, 55.3; October, 53.2; annual rainfall, 83.43 inches.

DOUGLAS COUNTY.

Douglas is a very large county and so situated as to have quite different climatic conditions in different portions. Drain is in the northern part of the county at an elevation of 300 feet. The annual temperature is 53.6 degrees; January, 42; April, 53; July, 67.1; October, 55.3; annual rainfall, 43.35 inches. At Gardiner near the coast the elevation is 72 feet; the annual rainfall, 78.37 inches; temperature for January, 44.7; April, 50.2; July, 60.3; October, 54.8. The average length of the season between killing frosts is 246 days, or about the same as at Dallas, Texas. At Roseburg, the county seat, near the center of the county, the elevation is 510 feet; annual temperature is 52.6 degrees; January, 40.8; April, 50.9; July, 66.5; October, 52.8; annual rainfall, 34.9 inches. The average period between killing frosts is 198 days, about the same as at Raleigh, North Carolina. At Glendale, in the southern portion of the county, the elevation is 1,441 feet; annual temperature, 54.1 in 1910; annual rainfall in 1910 was 27.55 inches compared with 28.95 at Roseburg the same year.

GILLIAM COUNTY.

Gilliam County is on the northern boundary of the State in eastern Oregon, and slopes toward the Columbia River. Blalock is on the Columbia River at an elevation of 237 feet and the conditions are

typical of only that portion of the county which is close to the Columbia river. The elevation is 237 feet; annual temperature, 56.1 degrees; that of January, 36 degrees; April, 55.7; July, 78.3; October, 57.3; annual period between frosts, 224 days; annual rainfall, 9.48 inches. Condon, the county seat, at an elevation of 2,884 feet, is more typical of the county as a whole. The annual temperature is 47.1 degrees; January, 24.4; April, 45.3; July, 66.3; October, 46; annual rainfall, 11:98 inches.

GRANT COUNTY.

Grant County is in the north central portion of the State and is one of the very large counties. Dayville, in the western part of the county, in the valley of the John Day River is at an elevation of 2,200 feet. The annual temperature is 50.8 degrees; January, 35.1; April, 50; July, 68.9; October, 51.4. At Canyon City the annual temperature is 51 degrees; January, 34.9; April, 49.1; July, 69.4; October, 52.8; average length of time between killing frosts, 140 days; annual rainfall, 17.23 inches.

HARNEY COUNTY.

Harney is an immense county in the southeastern part of the State. Burns, the county seat, is in the north central portion of the county, at an elevation of 4,157 feet. The annual temperature is 43.7 degrees; January, 23.3; April, 43.4; July, 65.8; October, 45.6; average length of season between killing frosts, 62 days; annual rainfall, 10.87 inches. Happy Valley, at an elevation of 4,200 feet has an annual temperature of 44.9 degrees and an annual rainfall of 13.73 inches.

HOOD RIVER COUNTY.

Hood River County includes mainly the territory drained by the Hood River. It is a comparatively small county in the eastern slope of the Cascade Mountains. The station at Hood River is at an elevation of 300 feet, but the greater part of the arable land of the county lies between 500 and 1,500 feet elevation. The annual temperature at Hood River is 50 degrees; January, 33.3; April, 49.5; July, 67.3; October, 51.7; annual rainfall, 36.11 inches. At Mountain Park for the year 1910 the temperature was 47.8 degrees; January, 27.6; April, 50.2; July, 66.7; October, 44; annual rainfall, 65.23 inches. The elevation of Mountain Park is 1,440 feet. The rainfall for 1910 was probably unusually large.

JACKSON COUNTY.

Jackson County is on the southern boundary of the State, and lies in the basin of the valley of Rogue River. At Jacksonville the elevation is 1,640 feet; annual temperature, 52.6 degrees; the annual rainfall, 27.9 inches. At Ashland on the northern slope of the Siskiyou Mountains, the annual temperature is 52.6 degrees; January, 38.5; April, 49.8; July, 69.8; October, 53.9; length of season between killing frosts, 177 days; annual rainfall, 20 inches; elevation, 1,963 feet.

JOSEPHINE COUNTY.

Josephine County is also situated in the Rogue River valley on the southern boundary of the State, and is immediately west of Jackson County. Grants Pass, the county seat, is at an elevation of 956 feet; its annual rainfall is 33.41 inches; annual temperature, 52.9 degrees; January, 38.7; April, 51.1; July, 69.6; October, 53.9.

The Woodlawn (Portland) School Garden, 1912.

KLAMATH COUNTY.

Klamath County is on the eastern slope of the Cascade Mountains, on the southern boundary of the State. The elevation of most of the county is above 4,000 feet. Klamath Falls, the county seat, is at an elevation of 4,100 feet. The annual temperature is 48.2 degrees; that of January, 30.3; April, 47.2; July, 67.7; October, 49.2. The annual rainfall is 14 inches.

LANE COUNTY.

Lane County includes the upper portion of the Willamette Valley with the addition of the portion of the section on the Coast drained by the Siuslaw River. Eugene, the county seat, is at an elevation of 449 feet. The annual temperature is 52.6 degrees; January, 39.9; April, 50.3; July, 65.6; October, 53.7; annual period between killing frosts, 196 days or about the same as at Washington, D. C.; annual rainfall, 37.49 inches. The conditions near the coast are practically the same as at Gardiner, Douglas County.

LAKE COUNTY.

Lake County is on the southern boundary of Oregon, in the eastern portion of the State. The general elevation of the county is above 4,000 feet. Lakeview, the county seat, is at an elevation of 4,825 feet. The annual temperature is 46.7 degrees; January, 28.2; April, 43.7; July, 66.7; October, 50.9. The annual rainfall is 17.18 inches.

LINCOLN COUNTY.

Lincoln County fronts on the ocean and is on the western slope of the Coast Range Mountains. Toledo, the county seat, is a few miles from the ocean at an elevation of 75 feet. The annual temperature is 51.7 degrees; January, 43.2; April, 49.1; July, 61.1; October, 54.5; annual rainfall, 75 inches.

LINN COUNTY.

Linn County extends from the Willamette Valley to the summit of the Cascade Mountains. The greater part of the arable land lies below 500 feet elevation, but as in all other Willamette Valley counties there is in the aggregate a large area of good farming and fruit land at elevations of from 500 to 1,500 feet. Albany the county seat, is at an elevation of 212 feet. The annual temperature is 52.5 degrees; January, 38.9; April, 51.8; July, 66.3; October, 52.4; annual rainfall, 42.98 inches.

MALHEUR COUNTY.

Malheur County is one of the very large counties of the State. It is on the eastern boundary and extends to the southern boundary. There is a comparatively small portion of the county which is below 2,500 feet elevation and where the summers are quite long and warm. Vale, the county seat, is at an elevation of 2,242 feet. Its annual temperature is 49.4 inches; January, 27.8; April, 48.5; July, 70.4; October, 48.4; annual rainfall, 9.90. At Beulah, in the eastern part of the county, at a much higher elevation than Vale, two years observation show an annual temperature of 44.8 degrees, and an annual rainfall of 10.32 inches.

MARION COUNTY.

Marion County is in the heart of the Willamette Valley. Salem, the county seat and capital of the State, is at an elevation of 120 feet. The annual temperature is 52.8 degrees; January, 40.3; April, 50.6; July, 66.4; October, 53.6; annual rainfall, 35.50 inches. The average period between killing frosts is 206 days or about the same as Raleigh, North Carolina, Jackson, Tennessee, and Guthrie, Oklahoma. At Mount Angel the elevation is 485 feet; annual temperature, 52.9 degrees; January, 39.4; April, 50.5; July, 67.2; October, 53.2; annual rainfall, 46.58 inches.

MHLTNOMAH COUNTY.

Multnomah County is a comparatively narrow strip extending along the Columbia River on the northern boundary of the State and extends into the Cascade Mountains. The arable land lies between 50 and 2,000 feet elevation. The altitude of the observation station in Portland is 57 feet. The annual temperature is 52.4 degrees; January, 39.1; April, 51.2; July, 66.3; October, 55.1; annual rainfall, 45.13 inches. The average period between killing frosts is 245 days, but for the greater part of the county is not quite so long.

MORROW COUNTY.

Morrow County slopes from the mountains to the Columbia River on the northern boundary of the State and is in eastern Oregon. Immediately along the Columbia River the climatic conditions are similar to those at Blalock, Gilliam County. Heppner, the county seat, is at an altitude of 1,950 feet. Its annual temperature is 50.2 degrees; January, 32.9; April, 48.4; July, 68.8; October, 51.3; annual rainfall, 14.16 inches; period between killing frosts, 150 days.

SHERMAN COUNTY.

Sherman County also fronts on the Columbia River in eastern Oregon, and the climatic conditions of the portion immediately adjoining the river are similar to those at Blalock, Gilliam County. Condon, the county seat, is at an elevation of 2,884 feet; the annual temperature is 47.1 degrees; January, 27.4; April, 45.3; July, 66.3; October, 46; annual rainfall, 11.98 inches.

POLK COUNTY.

Polk County is in the western part of the Willamette Valley, and includes both valley and hill lands. The Wallace Farm, on the eastern border of the county, is at an elevation of 170 feet. The annual temperature and rainfall vary but little from those of Salem, which is but a few miles away. Falls City, which is near the center of the county, is in a valley amid the foothills of the Coast Range Mountains. Its elevation is 355 feet. The annual temperature is 50.6 degrees; January, 38; April, 49; July, 63.2; October, 50.7; annual rainfall, 80.81 inches.

TILLAMOOK COUNTY.

This county lies along the ocean west of the summit of the Coast Range Mountains. Bay City, near the ocean, is at an elevation of 14 feet. Its annual temperature is 52.8 degrees; January, 43.2; April, 48.9; July, 59.4; October, 53.3; annual rainfall, 104.15 inches. At Glenora (Wilson P. O.) the elevation is 575 feet; annual temperature, 49.6 degrees; January, 37.1; April, 47.8; July, 62.7; October, 50.7; annual rainfall, 135.39 inches.

UMATILLA COUNTY.

Umatilla County is situated on the northwestern slope of the Blue Mountains and fronts on the Columbia River. It contains much diversity of climate. At Umatilla, on the Columbia River, the elevation is 340 feet; annual temperature, 52.5 degrees; April, 54.6; July, 75.4; October, 54.3; annual rainfall, 8.53 inches. At Pendleton, the county seat, the elevation is 1,817 feet; annual temperature, 51.9 degrees; January, 33.2; April, 51.6; July, 71.6; October, 51.5; annual rainfall, 14.16 inches; length of season between killing frosts, 150 days. At Weston the elevation is 1,800 feet; annual temperature, 48.6 degrees; annual rainfall, 23.89 inches.

UNION COUNTY.

Union County is in large part a round valley amid the Blue and other mountains. La Grande, the county seat, is at an elevation of 2,874 feet. The annual temperature is 48.3 degrees; January, 33.1; April, 47.7; July, 70.5; October, 49.4; annual rainfall, 19.12 inches. Much fruit is grown in this county without irrigation.

WALLOWA COUNTY.

Wallowa County is in the northeastern corner of the State and a large proportion of the county is mountainous. The elevation at Wallowa is 2,935 feet; annual temperature, 43.2 degrees; annual rainfall, 13.09 inches. Joseph is at an elevation of 4,400 feet. Its annual temperature is 42.3 degrees; January, 23.5; July, 62.6; annual rainfall, 20.40 inches.

WASCO COUNTY.

Wasco County fronts on the Columbia River and is just east of the Cascade Mountains. The altitude at The Dalles, the county seat, is 112 feet; the annual temperature, 52.5 degrees; January, 32.2; April, 53.5; July, 71.3; October, 52.4; annual rainfall, 14.97 inches; average length of season between killing frosts, 209 days, or about the same as at Greenville, South Carolina. At Wamic at a much higher altitude, near the center of the county, the annual temperature is 47.6 degrees; annual rainfall, 16.15 inches.

WASHINGTON COUNTY.

A large share of Washington County lies below 500 feet altitude, but there is also much arable land at higher altitudes. At Forest Grove the altitude is 220 feet; annual temperature, 51 degrees; January, 37.1; April, 49.4; July, 65.4; October, 51.8; annual rainfall, 48.92 inches.

WHEELER COUNTY.

Wheeler County is in the north central portion of eastern Oregon. Weather observations are not available but conditions do not greatly vary from those of Grant County.

YAMHILL COUNTY.

Much of Yamhill County lies at an altitude of less than 500 feet but a large share of the orchards of the county are found at higher altitudes. McMinnville, the county seat, is at an altitude of 182 feet. The annual temperature is 51.5 degrees; January, 38.6; April, 50.3; July, 64.7; October, 52.7; annual rainfall, 46.74 inches. Records kept at Fort Yamhill, in the western part of the county for the period 1857-1865, showed an annual temperature of 49.3 degrees; January, 37.1; April, 47.8; July, 60.9; October, 51.2; annual rainfall, 55.57 inches.

Oregon Spitzenburg Apple Trees.

BLACKSPOT CANKER OR APPLE TREE ANTHRACNOSE.

By W. H. LAWRENCE, *Plant Pathologist and Horticulturist for Hood River Apple Growers, Hood River, Oregon, and County Fruit Inspector for Hood River County.*

More than a decade has passed since the disease of the apple tree earlier known under a variety of names as canker, black canker, blackspot canker, blackspot apple canker, blackspot, deadspot, apple tree anthracnose, sour sap disease, now widely known as blackspot canker or anthracnose, made its appearance in apple orchards in various places throughout the Pacific Northwest. In the face of the fact that the disease is one of the most destructive of all the fungous disease of the apple throughout the sections in which it occurs, there are orchards in all of the localities that do not receive the proper attention to control the disease, principally due to neglect on the part of the orchardists, but also in part due to a lack of interest in the business or ignorance or both. Were it true that this disease had proven to be an extremely difficult one to combat, there would be some excuse for the presence of trees well plastered with cankers and in all conditions of health from the apparently healthy to the weak one loaded with a full crop of slowly developing apples—last effort to reproduce its kind before its death. Since this is the easiest to control of all of the diseases of the apple induced by a fungus, there can be no explanation other than neglect or indifference on the part of the person in charge of the property. The fact that the trouble has continued year after year, causing more or less damage, has been an incentive for studying this disease. Enough has been learned to appreciate how destructive the fungus causing the disease really is, and that the problem of its control or eradication is far more important than suspected at an earlier date.

Briefly stated, the history covering these investigations gives to Professor A. B. Cordley of the Oregon State Experiment Station, credit due him for investigations proving the relation of the fungus which he gave the name *gloeosporium malicorticis*, to the disease termed apple tree anthracnose. The writer later studied this disease with particular reference to cankers occurring on other trees and the fungi causing decay of apples placed in common storage. The fact that the fungus will attack the prune, plum and pear, causing surface cankers; will attack the cherry causing gummosis, and also causes a serious rot of apples in common storage, was established. The results of these studies were published in Bulletin 66 of the Washington Experiment Station under the title of Blackspot Canker, a name in keeping with the names in common use in the section in which the study was made as well as being a good descriptive name. More recently Professor H. S. Jackson of the Oregon Agricultural Experiment Station has proven that the fungus causing this disease, has, like many other well known forms of fungi, an ascigercus or perfect stage as well as a conidial or summer stage.

This fact has a very important bearing on the late investigations made on this disease by Mr. B. B. Pratt of the Bureau of Plant Industry

and the writer since the fungus has been found to be the cause of serious losses of apples kept in both common and cold storage. Pathological work with rots of the fruit of the quince done the past season established the relation of one of the rots of the quince to blackspot canker rot.

The results of the investigations relative to the development and action of the parasite, gives numerous important facts concerning the disease which may be summed up as follows:

Young cankers appear on the bark of the apple tree during November and later, first appearing on the tender twigs, water sprouts and more succulent two-year-old stems, later becoming conspicuous on the older portions, appearing between early November and early February, although the greater number do appear late in November to the middle of December or a little later. The source of the infection is spore forms. The spores, both ascospores (winter) and the conidia (summer), are apparently responsible for these infections. A large series of germination tests with the conidia show, while they may mature and will germinate the latter part of May and later throughout the season, that germination seldom takes place under ordinary field conditions but may be induced to do so at almost any time after the conidia are mature in size by providing the necessary moisture and maintaining a suitable temperature, which it is apparent these spores must have. The temperature and moisture conditions present in November and later are apparently the conditions best suited to the fungus as is evidenced by the appearance of a greater or lesser number of minute, round, somewhat depressed and dark colored areas which extend through the bark into the sap wood beneath. The investigations of Professor Jackson have also shown that the ascospores of this fungus are matured in the same cankers in which the conidia develop, but following the development of the conidial stage. It was proven that both conidia and ascospores thus developed in their order do induce the typical cankers. The relative value of the two kinds of spores as distributive agents has not been determined but it is evident that both play their part and are jointly effective in the continuation of the disease on infested trees, the spread to the bodies and fruit of other apple trees, the fruit of the quince, the trunks and limbs of the prune, plum, pear and cherry.

Of the facts discovered in the recent investigations, the occurrence of the disease on stored fruit from orchards in which anthracnose canker do not occur is the most surprising.

The following count made by Mr. B. B. Pratt, of the Bureau of Plant Industry, United States Department of Agriculture, on eight boxes of EXTRA FANCY SPITZENBURGS gives a very good idea of how severe the disease may become even upon fruit taken from well kept orchards as are the orchards from which these apples were taken.

Lot	First inspection	Percent Decayed	Second inspection	Percent Decayed
1	January 12	8.3	January 22	39.6
	February 17	62.5	February 27	83.3
	March 26	69.2	April 5	81.7
	May 10	89.1	May 20	95.0
2	January 12	0.0	January 22	5.0
	February 17	5.0	February 27	8.3
	March 26	6.3	April 5	7.1
	May 10	16.4	May 20	28.9

When it is understood that the eight boxes used in this experiment were selected and handled with more than ordinary care and that at the time they were examined were perfect except the areas where the fungus had gained an entrance, it is easily seen that greater care must be taken in preventing the spread of the disease. Data is not available which shows the relative abundance of the spots upon the apples given in the above statement. During the winter of 1910 the writer, however, had an opportunity to observe the apple rot developed on a quantity of Rhode Island Greening, which had been stored in boxes in a cellar. Of this lot of fruit 197 apples were inspected on January 30, 1911. There were a total of 1,023 decayed areas, 221 of which were larger than one-half inch in diameter, 139 areas were producing spores, 24 of which were slimy, the remainder being either or only slightly waxy. The fungus had entered through 68 scabby areas, eight injuries done by the bud moth, 15 mechanical injuries, four through the blossom end and five through the stem end, the remainder passing through the uninjured epidermis.

In the examination of this fruit which had been stored in two boxes, it was observed that apples with large discolored spots on them were distributed throughout the boxes, indicating that the spores had lodged upon the apples before the same were gathered. It was also noticeable that the apples in the bottom of the boxes were literally covered with decaying spots. In one case one group of 30 apples had eight large spots and 406 smaller ones. The observations made confirm previous observations indicating that as the spores mature the gelatinous substance surrounding the spores absorbs a large quantity of water from the atmosphere, finally going into solution. These masses of liquid containing spores finally run off, falling on the fruit beneath. Many times these drops splash from one apple to another. A line of small areas down the side or a group of spots show how the liquid splashed, scattering the spores.

The recognition and control of the diseases caused by fungus which is now known under the scientific name of neofabrea malicorticis (Cordley) Jackson is of great importance to all the growers of the apple, since the disease of the body of the tree directly threatens the life of the plant and serious losses of apples held in storage will occur in cases where the spores of the fungus lodge on the fruit before the apples are gathered. It is apparently true that spores lodge on the fruit some days before the general harvest of the apple crop takes place, since the early maturing apples are as subject to the rot as the later maturing varieties that may hang on the trees until the advent of the early autumn rains and later.

The discovery that there are two spore forms developed in each canker, and that the conidial matures the first year and the ascigerous the second year, should make the orchardist doubly cautious in attempting to eradicate the trouble, since the distribution of spore forms continues through so long a period and that damage to the body of the tree as well as the loss of the fruit after the crop has been placed in storage is apt to occur.

Owing to the fact that tests with lime-sulphur and Bordeaux mixture made on mature fruit shortly before picking time has at least given good indications that the fruit may be sprayed without injury, it seems advisable to resort to spraying in order to prevent loss of fruit in storage, especially in all cases where fruit is taken from diseased trees. Past seasons' experiences also indicate that such an application would no doubt be of great value in preventing the spread of late infection of apple scab which frequently takes place after the fruit has been wrapped in paper and placed in storage.

Owing to the late date at which apple harvest continues, it is sometimes true that the autumn rains make the soil so loose and muddy that it is impossible to apply a spray following the gathering of the fruit. In such cases there are other practices which may be followed with good success. A thorough spraying of Bordeaux mixture before the buds begin to open during the spring and while the entire tree is exposed to the direct drive of the spray the trees have been so thoroughly coated that the amount of Bordeaux mixture remaining on the trees throughout the seasons, including the following autumn, was sufficient to give as good results as could be gotten by spraying at any other date. These phenomenal results are less wonderful since it is now known that the old cankers two years of age are the seat of a second set of spores thrown off the second season and capable of starting new infections. This early spraying admits of thoroughly soaking these old cankers, which if in a dry condition have been observed to become a deeper blue color on the application of Bordeaux mixture, the dry and dead bark absorbing the liquid like a sponge.

In the cleaning up of any orchard of trees that have become badly infested with the disease it is advisable to tear out the bark from all cankers after the cankers of the present year are mature in size. Each wound should also be coated with thick Bordeaux mixture, since through experiments conducted by the writer, it is evident that the fungus will thrive in the wood as a saprophyte as well as in the old and dead bark previously killed by the fungus. In case time will not admit of removing the bark the cankers should be thoroughly plastered with the spray. Cutting out the growing cankers may also be done and is advisable when the condition of the orchard will admit of such a practice. In cutting out the cankers on badly infested trees very frequently more injury is done in doing the work than the fungus would do if left to complete the season's growth.

The timing for spraying infested trees depends upon several important orchard practices and it is therefore very important that the timing should be carefully considered. Anticipating loss from the rot, which is sure to follow when fruit is exposed to the spread of spores during the last part of summer and early autumn, the most logical method of meeting the situation is to apply a spray before the fruit is gathered in order to kill the spores adhering to the apples. In making this application it is not necessary to use a very strong spray, since the weaker mixture (4-4-50 Bordeaux) carries a far greater per cent of the killing properties than are actually required to do the work; besides the coating of the apple is only temporary, serving to protect the surface of the fruit until it has been placed in the warehouse or packing-house from which the fruit is packed following the wiping of the same, a practice which apparently pleases the consumer, although not to be considered at all necessary when considering the action of the spray ingredients on the keeping qualities of the fruit. Another consideration relative to the application of autumn sprays to control this disease is the partial destruction of the scab fungus which at this time is apt to be very abundant on the foliage. It is apparent from field observations and experiments that the coating of spray left on the leaves during the fall spraying that the active principles of the ingredients applied do act favorably in at least lessening the spread of the fungus the following spring.

Since it is less difficult to spray a tree after the fruit has been gathered, it is generally advisable that the autumn spray follow the gathering of the fruit. In cases of light infestation only one spraying is necessary. When the disease is abundant, however, two applications

should be made. For these applications 6-4-50 Bordeaux mixture is advised. Of the two applications, the first should immediately follow the gathering of the fruit. This is necessary in order that the work may be done before rainy weather sets in. The second application should be made two to three weeks later, depending upon weather conditions—if heavy rains occur the spraying should be done within two weeks, otherwise the work may be delayed one to two weeks later. All spraying done to control anthracnose must be done thoroughly in order to get the desired results.

Owing to the fact that even following the application of double strength Bordeaux (12-8-50) mixture, as is recommended for use in Western Washington, much of the active principles in the spray are rendered worthless by being removed from the tree early during the season by heavy showers or during long rainy periods. In order to meet this situation the writer prepared a mixture known as Bordeaux-petroleum emulsion, spraying the trees twice before the heavy rains began. Although only four trees, all badly infested with the disease, as shown by the presence of a large number of cankers from which spores were being discharged, three of which were sprayed with the mixture, good results in the control of the disease were secured as well as discovering that the petroleum contained in the mixture had a toxic effect, the leaves being much darker and healthier than those on the unsprayed tree or those which had only received coatings of Bordeaux mixture and standing in the same part of the orchard.

Field of Rhubarb, Canby, Oregon.

VEGETABLE GROWING IN OREGON.

By O. E. FREYTAG, *County Fruit Inspector for Clackamas County.*

No phase of agriculture is developing more rapidly than market gardening and at no time has the work received greater support. The population of the State is increasing so rapidly that the demand for vegetables exceeds the supply. Many gardeners are specializing along certain lines of vegetables which they have brought to a high point of development, producing a product the market is ever ready for.

Among the first crops is the palatable asparagus. No garden, whether for home or market, is complete without an asparagus bed. The plants adapt themselves to any fairly good soil and climate, but thrive best in sandy loam or beaver dam. The better the soil the better the yield.

How to Plant an Asparagus Bed.—Make the rows preferably north and south, four feet apart. The plow going up and down at least twice through the furrow, digging the trench at least six to eight inches deep. Then stretch a string down the furrow, and set the plants every 20 to 24 inches in the row. Spread the roots out carefully, covering them three to four inches. After the shoots appear more soil may be added. Don't cut the asparagus the first year and very little if any the second year; the third year begin cutting and as the plant grows older the season for cutting may be lengthened.

Rhubarb is a valuable and productive early vegetable, and when grown in the right manner produces an enormous yield. The manner of planting is very much the same as asparagus. When rhubarb is grown by expert growers, the stalks are often over two feet long and perfectly tender.

Celery is another immense money crop, and those gardeners who specialize in this particular class are enjoying good results. There are a number of methods used to blanch celery. In Oregon, where lumber is cheap, board banking is preferred to the old way of dirt banking. This is quickly done and gives good satisfaction. The greatest care is in preparing it for the market, so that it arrives at its destination in good shape.

Cabbage and cauliflower are valuable crops in Oregon. Climatic conditions are such that certain varieties of cauliflower can remain unprotected in the field throughout the winter, supplying the fresh product when there is little else to be obtained in the market. For early cabbage, seed sown in September and transplanted in November and December, produce early crops and the land can be used for a second crop. Soil should be selected that has good drainage. While the plants do not make a large growth during the winter, they build up a good root system, and upon the arrival of congenial weather come rapidly to maturity. Cabbage will thrive upon most any soil, but a sandy loam is preferable, because the soil can be cultivated at any time. Cabbage is a great feeder and requires good, rich soil, and plenty of cultivation. Care should be taken not to plant it too close to get the best results, especially the winter varieties. Plants three feet each way will give you

4,840 per acre; at this rate you can secure larger heads and it will give a greater tonnage than closer planting. Great care should be taken to get the best seed. In no truck crop does the character of the seed count for more than in cabbage. The grower cannot afford to risk his crop for a small saving. This is true of all kinds of seed. There is no greater disappointment than to discover that your labor for the season has been useless, because you have bought cheap and useless seeds. The year is spent and nothing for it but failure. One often blames the soil and weather conditions, when the seed is at fault. Some of the best varieties for Oregon are Early Jersey Wakefield or Charleston Wakefield; late cabbage, the Danish Ball Head (imported seed), is chiefly grown for storage and sour kraut. Care should be taken when transplanting in hot weather, when evaporation is rapid. It is at that season advisable to prune off most of the leaves; in this way the plant receives less check than it otherwise would. Seed beds for cabbage should be prepared in a new place each year, either broad cast, or in drills. Care must be taken to have healthy plants. It is well to sow a thin coat of salt on the soil and work it in before sowing the seed. This destroys the fungus that may be in the land, which causes club-root and other diseases.

Cauliflower plants are grown the same as cabbage plants, both the early and late varieties, and are transplanted in the same manner. In order to have the plants grow rapidly and produce the desired quality of product, good cultivation must be given, and in order to do this, the plants should be set so as to cultivate both ways. If you will give the plants the necessary cultivation and float the land between the rows to conserve the moisture of the late planting, you will find that the aphis will not do so much harm, for the aphis will only attack the weak plants. When the cauliflower begins to head, in order to bleach, the leaves should be loosely gathered together and pinned with a toothpick, so as not to exclude air, but only to keep off most of the sunshine. To draw the leaves too close will scald the head, therefore let the plant have plenty of air. In case of shipping and packing the cauliflower should be cut early in the morning while they are cold. But if it is necessary to cut in the afternoon, care should be taken to spread them out over night so as to cool them before packing. They will stand shipping better and will keep much longer by this simple pre-cooling.

Onion-growing is one of the most profitable industries of Oregon. Soil and climate conditions are such as to produce a good onion, mild and withal a good shipper and keeper. Most any good soil will produce onions. However, some soils are better than others; the famous Oregon beaverdam land is without question the best.

How to Prepare the Onion Land.—Plow the land deep, pulverize and smooth it, let the land rest about two weeks then harrow thoroughly a second time and smooth it; in this way the first crop of weeds are destroyed that otherwise would have to be weeded by hand. This method of preparing the soil is good for any crop that is likely to require weeding. Onions require rich soil, and the cheapest manure for onion land is to sow early in September about 75 pounds of vetch seed, and in early spring plow this under, and good large onions will be the result. Another very essential way of helping the onion is to give the land a good dressing of salt about two weeks before planting. Onions like salt. To produce sweet onions they must be kept growing rapidly. Stunted onions are sharp and strong. Sow the seed as early as possible and not later than about the 1st of April. Onions should ripen about August 15th to 20th. The early crop brings good prices; the writer of this article has sown onion seeds as early as February 3rd and as late as

March 17th, and has begun to harvest August 5th. Farmers living on the uplands can grow onions as good as those produced on beaverdam land, but they must employ one of two systems. The seed should be sown in boxes in January or February; sow very thinly so as to produce strong plants. In May these may be transplanted to the field. Prune the roots and most of the top, leaving the plant about three and one-half inches long. Do not set too deep in the soil, preferably not over an inch. The other way is to sow the seeds early in June, not too thick, in drills; these will make good sets in August, which may then be planted immediately, for spring onions, or in spring for fall onions. Spring planting is preferable; good large onions are grown this way. The varieties giving the best results are the Oregon Globe Danvers; Prizetaker and Australian Brown are also good onions. However, before long some will grow the Bermuda Onions, which are of good quality and mature in about 75 days. Onions should be carefully and properly graded, the bulb must be clean and attractive, and not undersized. The shipper requires clean sacks properly filled and sewed. All this goes to make money for the grower. The onions should be sorted into three grades, first or prime, second and picklings.

A Few Facts About Corn-Growing.—Though Oregon is not considered a corn-growing State, especially stock or field corn, the acreage is increasing every year and very soon some one will produce a stock corn suited to Oregon climate. If the State of Oregon could import hot nights, lightning bugs and cyclones we might grow better corn. But thanks; we will grow a little less field corn, and turn our attention to sweet corn. We can beat the cars growing sweet corn, which will net the grower $100 to $150 per acre and have the stalks for feed besides, and the demand for corn is good during the whole season, beginning about July 15th and lasting until December. The hogs and cattle enjoy the sweet corn just as well, and the stalks contain more saccharine, and it is really better than field corn. The sandy loam is best suited for corn-growing. Farmers on upland do grow good corn by more frequent cultivation, planting so as to cultivate both ways. Two crops might be grown successfully, if not planted too close together, by planting three feet each way and thinning to two stalks in a hill and in about every third hill dropping a pumpkin seed. The yellow field pumpkin does the best. There are many varieties of sweet corn and one must find out what variety is best adapted to the locality. Commonly the best early corn is the Mammoth White-Cob Cory. A very pleasant but small ear, is the Golden Bantam. Corn requires good cultivation; before laying it by, the land should be floated between the rows, thus conserving the moisture and making the corn fill out an inch beyond the husks.

Beans and peas are so common it is useless to comment on these, only to say do not sow the seed too thick if you desire good tender pods. There are several kinds of edible pod beans, such as the Stringless Green Pod. Davis Kidney Wax, a pole bean, the Kentucky Wonder; the Dwarf or Pole Horticultural is a good winter or dry bean. A good white or dry bean is the Imperial Tree bean, a heavy cropper, resembling the Navy bean. Beans require good cultivation to keep them free from weeds, and a great many mouths to eat them. Peas and beans are legumes and do not require too rich a soil, and make a good second crop, where early vegetables have been grown. One of the best early peas is the Early Gradus.

Tomatoes are chiefly grown by truck gardeners. However, every home-gardener and farmer can grow tomatoes successfully, if a few suggestions given are carried out. Tomato seed should be soaked in a solution of Bordeaux for 24 hours; this will in a measure destroy the

blight, which in many cases destroys a large per cent of the plant. Bluestone three pounds and lime six pounds is used in a case of this kind. Sow the seed as soon as possible in March in hotbeds. After about two inches high, transplant to cold frame, two inches apart each way. Expose them all you can, cover only on clear frosty nights. In so doing you harden the plants that they may be transplanted to the open field by the 10th to 15th of April. Do not use a dibble, but mark out the land, three and one-half feet between the rows, then draw the single furrow out, about three inches deep. In this furrow plant the tomatoes; lay the plant against one side of the furrow and put a little soil over the roots loosely, do not press it down. The warmth of the sun warms the roots closely under the soil and the plant starts at once. By planting with a dibble the roots are placed usually too deep where the ground is cold and the plant loses too much time. Set the plants 18 to 20 inches if staked, if not staked, 30 to 36 inches. To stake tomatoes use a stake an inch to one and a half inches, five feet long; drive it firmly into the ground, then tie the plant loosely but firmly to the stake. Care must be taken to pinch out all side shoots, allowing only the main leader to remain. The side shoots retard the growth and fruitage of the plant. Some train on frame, others let them grow as they please; whatever method is employed, remove the side shoots. Preparation of the soil is very important. Plow the soil deep, have the land fairly rich, and about two weeks before planting use 100 pounds of coarse salt per acre; this will destroy the fungus matter in the soil and will prevent tomato blight at least to a great degree. Give frequent cultivation, but not deep, and when vines are well loaded with fruit, float the land and begin picking ripe tomatoes. For an all round good crop the Jewell is a satisfactory variety. The Dwarf Champion is a good one.

Melons require hot nights, the same as corn, and are usually grown on sandy loam soil. The muskmelon does excellently well where good care and cultivation is given them. Watermelons are a paying crop in Southern Oregon, especially sections near transportation and good markets. The market requires a great quantity of melons, but care should be taken to grow the varieties the market requires. The Rocky Ford, Petosky and Emerald Gem are perhaps the best muskmelons for our western climate. Melons require rich soil well prepared, and before vines begin to cover the land, it should be floated to conserve the moisture of the soil. Try out your soil, build it up, make it produce large crops.

Potato-growing is the chief and most popular vegetable crop grown in Oregon. Thousands of carloads go to eastern and southern markets from this State annually. The farmers should take more care to plant potatoes true to type and also those varieties the markets require. Seed selection is most important. Every farmer should select the seed at digging time, when perfect specimens and good hills can be selected. Potatoes true to type should be planted; off shapes are likely to produce ill shaped potatoes, and at the same time the quality and quantity must be considered. The importance of good seed is only appreciated by those that have made the potato culture a study, which every farmer should do. Improve your potato seed, as well as other crops. Improve the strain of your poultry, hogs, cows and all else that go to make up a systematic farm. How can this be accomplished? By careful seed selection year after year, by noting results and keeping accurate accounts of season of planting and harvest and the manner of preparing the soil and planting the seed.

After careful experiment with the soil to be worked, a full knowledge of frost conditions, and of the needs of the market through whose medium the products are to be disposed of, vegetables should be chosen

which are best adapted to conditions as they are found. A study of their habits and needs and close application to detail will bring a well-earned success. With the diversity of crops possible in the mild climate of western Oregon, and the established fact that the region suffers no absolute crop failures, such as frequently occur in less favored sections, gardening on a small scale or on larger lines may be made to return goodly profits on the time and money invested. By continuing year after year to raise those products found to give best results, success may be surely attained.

Young Cherry Orchard With Strawberries—Willamette Valley.

CHERRY CULTURE.

By J. Beebe, *County Fruit Inspector for Lane County.*

In presenting this subject I am aware that much has been said and written on it, and what I may say will be largely repetition. But, in considering an industry that is of as much importance as cherry-growing, some things will bear repeating, especially at this time when so many who are without practical experience are planting fruit trees. Any reliable information on the more important points in the culture of the trees may be of great help to them.

To make a success of cherry growing one must start right. Select a good, deep soil, well drained. That is, land where not only the surface water runs off readily but which also has a good under-drainage.

The ground should be well prepared, subsoiling to a depth of 16 or 18 inches, thus giving the roots a chance to become established down where they will have moisture, and making it possible to plow without disturbing the roots. This is very important, as there is nothing that hurts a cherry tree more than disturbing the roots. The plowing or cultivating should be done every year; for if left uncultivated the feeding roots come close to the curface for air and plant food; then, if cultivation is resumed these roots will be torn and disturbed, which causes trouble with the trees.

The trees for setting should be one year old, good, heavy stalks and well matured before removing from the nursery row. All large-growing sweet cherries should be set forty feet apart, and the trees when planted cut back to twenty inches high. Cultivated crops, such as potatoes or corn, may be planted between the rows while the trees are small; or peach trees may be set between each row and when cherries and peaches have grown large enough to crowd remove the peaches and give the cherries all the ground.

In the cultivation of a cherry orchard there may be a difference of opinion on account of soil and moisture conditions. There are locations where the moisture remains good during the season, or we might say, where there is sub-irrigation. Here the cultivation might be discontinued after the trees have become well established but under ordinary conditions cultivation should be maintained.

After the trees begin to bear cover crops may be sown in the fall and plowed under the next spring to keep up humus in the soil and furnish plant food for the trees. Here in the Willamette Valley the vetch makes a good cover crop; for, being a legume, it furnishes nitrogen, giving the trees a dark green color and vigorous growth. Where there is plenty of wood growth, rye, oats, or anything that will keep up the humus, may be sown instead of vetch.

Cherry trees require but little pruning. Just enough in the start to give the tree its shape, or to cut out cross limbs and center limbs that carry the tree too high.

While all these things are necessary for successful cherry growing, there are still others that must be mentioned; and perhaps we might

consider these as the drawbacks to cherry culture; namely, the diseases and insect pests that work on the trees. The first, and worst, is the cherry gummosis, which, our professors at the experiment station tell us, is a bacterial disease and rather difficult to handle. The only remedy known as yet is cutting out the gum spots clean, to the sound bark and disinfecting the wounds with corrosive sublimate 1 to 1,000; also disinfecting the tools before cutting into another tree. If wounds are large, as soon as dry, they may be covered with paint to protect the wood. The trees should be watched closely for this trouble during the early part of the season.

In some sections a shothole fungus is doing some damage. To control this, spray with Bordeaux mixture after the bloom has fallen and again in about two weeks.

There are three insect pests that do more or less damage to the trees, the San Jose scale, black aphis and the cherry slug. The scale soon shows its work on the trees, but is easily controlled by spraying with lime and surphur while the trees are dormant. The black aphis is more difficult to fight. It works on the under side of the terminal leaves, causing them to roll and later to fall off. The remedy is black leaf sheep dip or coal-oil emulsion applied when aphis first makes its appearance. Repeat as often as necessary.

The slugs are not hard to destroy. On bearing trees, if a dust sprayer can be obtained, air-slacked lime may be used with good results. On young trees arsenate of lead or any contact spray may be used.

Successful cherry culture, as well as any other business, requires close attention to the several details.

While there has been more attention given to growing the sweet cherry, there is a demand for many more of the sour cherries for canning purposes then are being raised. This variety is not quite so exacting in its culture, not so subject to disease and a sure bearer. The sour cherries are mostly a little earlier than the sweet cherries, making the harvesting season a little longer.

Since cherries can be grown successfully here it seems that this branch of horticulture might be stimulated far beyond what it now is; for it has been conclusively proven that the Pacific Northwest, and especially the Willamette Valley, produces a cherry unsurpassed in beauty and flavor anywhere in the United States.

In conclusion, while Hood River has become famous for its apples and strawberries, Rogue River for its pears and Newtown apples, why may not the Willamette Valley stand out prominently for its quantities of the finest cherries in the world, as one of its horticultural products?

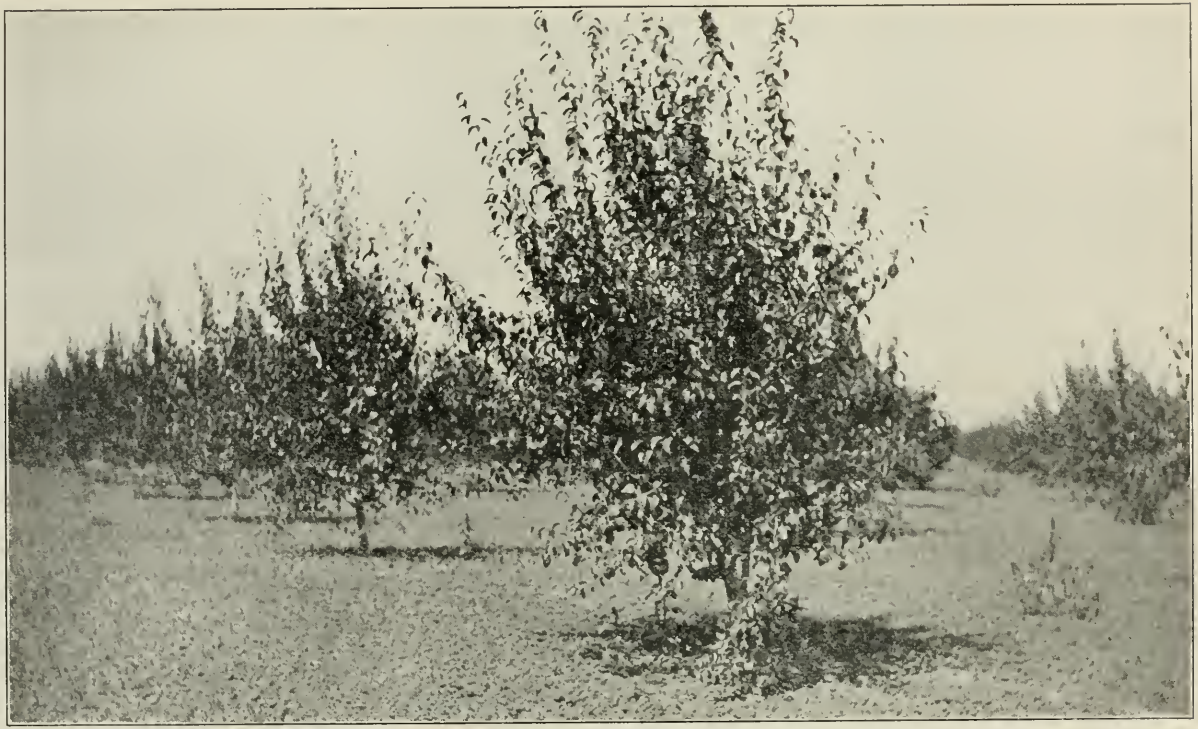
THE CONTROL OF FIRE OR POME BLIGHT.

By W. H. Lawrence, *Plant Pathologist and Fruit Inspector for Hood River County.*

The abrupt termination of pear production throughout a majority of the fruit-growing sections of the United States, where the pear has been grown commercially, has demonstrated the destructive nature of the pome blight bacterium. In fact, some of the epidemics caused by this parasite are so recent and the results so marked that no encouragement to attempt to grow the pear in many sections where the disease has been epidemic can be had. More recently the disease has made serious inroads in some of the apple orchards in the section in which the disease has done little or no injury heretofore. The condition of the apple orchards in some of the locations at this time is not encouraging and it is feared that a similar epidemic may occur among apples as has occurred among pears during the past. The critical condition as it is now being faced by many growers has caused the grower to enquire with reference to detail instructions as to a successful method of accomplishing the desired results, namely, the eradication of the disease from the orchard.

The eradication of the disease in a section where the fruit industry has grown to large proportions is by no means an easy task. The results usually met with have not been very encouraging but they have fully demonstrated that the best of results may be accomplished if the work is timely and is done in a careful and painstaking manner. The topography of the country, kinds of farming practiced, the various hosts, both wild and cultivated that have become infested, the moral support to be given by the community, the possibilities of the assistants to do the actual field work and lastly and the most important of all, the strength of the law providing for the destruction of plants infested with a dangerous and contagious disease, all have an important bearing on the work.

The topography of the country in a large degree renders the work difficult if the infested areas are inaccessible, requiring a large waste of time in reaching the localities in which the work must be done, as is the case where there are numerous gorges and canyons in some of the fruit-growing sections. On the other hand, where the conditions are such as to admit of diversity in crop production, there are the intervening ranches on which fruit raising is a secondary line of work, which in most cases means that this line of work is considered as of little importance and is largely endured since the fruit is very convenient for the house wife in preparing the food. The farmer is not willing to sacrifice valuable time in an attempt to rid this orchard of the disease and to watch the same to see that no further infection takes place. As long as such fruit trees live it is certainly true that they are very apt to become the centers of infection at later dates or until the disease has been eliminated from the section. It is also indeed fortunate to be located in a section where the natural barriers do not admit of an easy introduction of the disease. A wide range of mountains surrounding the section on all sides is a natural protection with which few of the fruit-growing sections are provided.



Five-Year-Old Bosc Pear Trees—Rogue River Valley.

In attempting to eradicate fire blight in any section one of the important considerations is the extent of the spread throughout the territory as well as the severity of the disease on the numerous varieties of apples and other fruit trees that may have become infected. The age of the trees and the location of cankers vary the time and the cost of doing the work as well as determining the cost. Since the cut and burn method is the one that must be employed, the method is a tedious and costly one.

The presence or absence of wild plants that are hosts of the blight bacterium is a point that must not be overlooked, as the destruction of these hosts is one of the most important lines of work to be taken up. Wide areas of land growing infested hosts makes the work very discouraging while an absence of such plants makes the beginning of the task at least more encouraging.

Nothing is more discouraging than the lack of moral support in a community where the control of the disease confronts one. A lack of such support usually means an indifferent physical and financial support. In fighting this disease it is impossible to accomplish results unless the right kind of help can be secured to do the work. It has been the experience in the past that the man who has no interest in the work other than the pay he draws for the time he works is not as effective a worker as one who has a financial interest in getting results. In sections where the orchards are large, it is oftentimes true that the results are not so good as are obtained in smaller orchards. Such results are attributable to the personal element of help, as in the larger orchards less reliable help must necessarily be depended upon, while in the smaller holdings the owner personally lends much assistance that bears good returns.

The nature and importance of this work requires a director who has the training requisite to do such work. He must be well trained along pathological lines in order that he may appreciate the true nature of the parasite causing the disease and to instruct the field workers so that they have a good working knowledge relative to the control of the disease. Every laborer must be taught to thoroughly understand the life-history of the bacterium, as to its method of passing the winter, how the organisms spread in the spring and how they are placed in the blossoms and other parts of the tree, how these minute organisms grow and multiply in the juices of the plant, and last and the most important of all, the fact that the wood may be diseased and yet no discoloration visible to the naked eye is evident, which knowledge has a direct bearing on the effectiveness of the tree surgery to be practiced upon the infested portion of the plant. The use of the disinfectant constantly on all cut surfaces and all pruning instruments must also be enforced, since the minuteness of the organism is not comprehended by the untrained worker who usually lacks faith in the work of using the disinfectant to destroy something invisible—believed by a majority but a matter of conjecture by others, many of which fail to make known the fact that they are doubting Thomases.

The effectiveness of the work in controlling or eradicating fire blight largely depends upon how well the work is organized and that the work when once started can be conducted to its completion without delays. The time of starting the work is also a very important consideration. The slow advance made by the disease during the dormant period of the tree makes it advisable to start the work as early during the dormant season as possible, so that the same may be completed if possible before the following spring, at which time the disease may spread over a portion of the ground already covered. The work should be done at any and all times, as the occasion requires.

Clackamas County Peach Orchard.

CO-OPERATIVE ORGANIZATION OF FRUIT GROWERS.

By H. C. ATWELL, *Fruit Inspector for Washington County, and President of Forest Grove Fruit-Growers' Association.*

I am asked to offer a few suggestions as to best means of effecting and utilizing co-operative organization among fruit-growers, and to explain the work which the Forest Grove fruit-growers are undertaking to do.

My first suggection would be, do not organize hastily, nor before the volume of fruit production in your community is of sufficient proportions to support your undertaking. Do not allow real estate exploitation to force you to premature activity.

LIMIT STOCK HOLDING TO FARMERS.

As a first step, the farmers should organize a fruit-growers' association. When I say farmers, I mean farmers, not merchants and bankers. Forest Grove Fruit-Growers' Association has over one hundred stockholders, every one a farmer. The business men of the city are not barred, but we did not ask them. We did not want them, because they are not directly interested in fruit-growing. In times of stress they would want their money out. The organization and its equipment would not appeal to them as in itself an asset, independent of their investment. They would not be patrons. In other words, their interest would be limited to their stockholding. We did not need the townspeople's money, because we had enough of our own. It is a poorer community than any in Oregon where a hundred farmers can not raise five thousand dollars during a year to capitalize a farmers' co-operative organization. The banks groan under the weight of the farmers' deposits, and the farmers plod along, in need of various public enterprises, waiting for someone to establish them with the farmers' money, and reap the rewards. Why should not the farmers do it themselves? We limited the earnings on our stock to six per cent, so stockholding in itself would not be attractive. We limited individual holdings to five hundred dollars. We would have placed the limit at two hundred dollars, had not an enterprising farmer subscribed five hundred before our by-laws were adopted.

A MODEST CAPITAL.

An association without capital can not accomplish much in handling fruit, either by way of shipping fresh or manufacturing. If your association is to be more than educational, it must have some financial resources. However, it is not good policy to try to raise a large capital at the start. If you have a big capital, you will have big ideas and be tempted to do things on a big scale. The results may be as disastrous as those which have marked the history of many co-operative undertakings among farmers. Better grow up from small beginnings, and practice rigid economy, confining your operations to a few lines, until you have felt your way to solid ground. Capital can be increased when more is needed.

BUYING FOR CASH.

I speak of this subject now, because it is involved in consideration of what is a necessary capital. With a modest capital, say five to ten thousand dollars (ours is five thousand), it follows that you can not, without heavy borrowing and considerable risk, buy fruit extensively for cash. Your capital will be largely absorbed by the site, buildings and equipment. You will of course have to borrow some money, but the aim of the directors should be to borrow as little as possible. Herein is involved the essence of co-operation. Merely clubbing together to buy a site and erect and equip a building, is but a short chapter in the story of a truly co-operative association. Growers must expect, and be glad, to contribute their fruit to the association and wait for the larger part of their returns until the fruit is sold, confident in the expectation of a larger profit by so doing. This idea is remarkably difficult for many farmers to grasp. They apparently expect to deal with the association, of which they are a component part, as though it were a stranger; and they ask "what are you going to pay"? My answer has been: "The sole purpose of this organization is to secure to its members the greatest possible profit from their products. This purpose can not be attained by buying for cash, but by members being willing to wait for the major part of their returns until the product is sold". Last year the Portland canneries paid three cents per pound for loganberries. The same price was paid by the management of the Eugene Fruit Growers' Association to the ten per cent of its members who insisted on cash at delivery. The ninety per cent who better understood the true principle of co-operation (or perhaps who were less pressed for money) received, a few weeks later, returns which netted them three and a half cents a pound. This difference in return amounts to sixteen and two-thirds per cent. Farmers are prone to complain of the large profits made by others on the output of their toil. Why should they expect an institution to tie up twenty-five or fifty thousand dollars in cash necessary to do a cash business, and take all the risks, without exacting a handsome margin therefor? Why rather should not the farmers treat their output as capital, distribute the risk among themselves, and put this margin into their own pockets? Why should they not, as Manager Holt of the Eugene association puts it, treat their association as the "business end of their farms", and make it yield them the extra sixteen and two-thirds per cent?

PURCHASE OF A SITE.

Do not be too economical in the purchase of a site. Provide room for future expansion. You will probably erect but one building at first but later you will need more. If you contemplate a cannery, remember that in a few years it will demand considerable space. Manager Holt says that their two acres are none too much. Locate where you can secure a railroad switch. Our association has an acre accessible to two railroads.

BENEFITS FOR MEMBERS ONLY.

It is but fair that you should limit the advantages of your organization, both as to pooling and in the purchase of supplies, to members only. It is a business proposition. Those who have invested their faith and money are the ones entitled to the benefits.

EVERY MEMBER A PARTNER.

The manager should miss no opportunity to make every member feel that he is a joint owner in the association and its property, jointly interested in its success; that each member is, or should be, in spirit a partner (although not legally so), and interested in keeping down expense, and seeing that the association pursues a safe and conservative course. Members should be made to realize that the association is not a commission house, seeking to make as much as possible for itself, but that it is a thing of their own creation, acting solely for their interests; that it is themselves acting through delegated authority.

SAFE BUSINESS METHODS NECESSARY.

While the association is for the benefit of the farmers, that benefit should be held secondary to the sound financial condition and the perpetuity of the association. It should avoid speculation, and do nothing to impair its credit and business efficiency. Fruit-growers should know that they have a more than one season's interest in the success of the association. If it is compelled to suspend, the marketing of their products reverts to haphazard methods.

HOW TO EFFECT A LEGAL ORGANIZATION.

Your organization should be incorporated. Otherwise the members will be only partners. A partnership of so many persons would be a cumbersome and embarrassing proposition. It would also cause an individual liability that would be undesirable. If you incorporate, members' individual liability will be limited to their unpaid subscriptions for stock. The assets of a corporation are alone liable for corporate obligations. The steps necessary to incorporate and get the organization on to a legal footing, prepared to do business, are simple, but they should be followed in proper order and with care. A brief outline of them may be useful to communities wishing to incorporate an association, and not wishing to incur the expense of legal assistance.

A meeting of fruit-growers should be called. If it is then decided to organize an association, a motion should be made that A, B and C (naming them) be authorized to prepare and file articles of incorporation of the proposed association. The three persons thus chosen should make and subscribe written articles of incorporation, in triplicate, and should acknowledge them before a notary. They must file one of these documents in the office of the clerk of their county, mail another to the Secretary of State at Salem, to be filed by him, and keep the third copy, to be turned over to the secretary of their association when their organization is completed. These articles of incorporation must specify five things: 1—the name of the association, and the proposed duration of its existence; 2—the business in which the association proposes to engage; 3—the place where the principal office will be (that is, the town or city); 4—the amount of capital stock; 5—the amount of each share thereof. In complying with the second requisite, it is best to embrace as many activities as the association will likely wish to pursue, in order that they may not be hampered by lack of legal authority, when their business becomes more complex. I have incorporated herewith the articles of incorporation of our association as a model of the proper form. The second specification required by law to be made is sufficiently comprehensive in our articles to cover any enterprise in which a fruit-growers' organization should engage.

A Two-Year-Old Pear Orchard—Rogue River Valley.

The preliminary meeting above referred to should provide for the expense of incorporation. This consists of the usual fee for filing with the county clerk, also an organization fee and an annual license fee. The last two fees are to be remitted to the Secretary of State with the articles of incorporation. The organization fee and license fee are graduated in accordance with the amount of the capital stock. If this is not over twenty-five thousand dollars, the two fees are the same, to-wit: ten dollars where the capital does not exceed five thousand dollars; fifteen dollars where the capital exceeds five thousand, but does not exceed ten thousand dollars; twenty dollars where the capital exceeds ten thousand, but does not exceed twenty-five thousand dollars. The organization fee is paid but once. The license fee is an annual matter. The latter should be computed for the time between the date of remittance and July 1st following.

The same meeting may, if thought best, appoint a committee to solicit subscriptions to the capital stock. A sufficient form for such subscription would be as follows: "We hereby subscribe the sums set opposite our respective names to the capital stock of an association, to be hereafter incorporated by authority of a meeting of fruit-growers held at (name the town) on (date)." The subscriptions may even precede the vote to incorporate. In that case the subscription should read, "We hereby subscribe the sums set opposite our respective names to the capital stock of an association of fruit-growers of (name the town) and vicinity, provided said association be incorporated by (insert date)."

Filing the articles in the two offices named, and payment of above named fees, constitute incorporation. The three corporators who filed the articles represent the corporation. If stock subscriptions have not been secured, or it seems to the corporators desirable that additional stock should be subscribed before organization, they or any number of them designated by a majority may solicit and receive subscriptions.

As soon as the capital stock has been subscribed, the three corporators must give notice to the stock subscribers to meet at a designated time and place for the purpose of electing directors. This notice may be issued as soon as one-half the stock has been subscribed. At Forest Grove we perferred to wait until the entire stock had been subscribed. The notice must be given by publishing the same for thirty days before such meeting, in some newspaper published at least once a week in the county where the meeting is to be held, or in some newspaper published in like manner and in general circulation in said county. It is very important that the notice be given as above recited. Upon expiration of the thirty days an affidavit should be secured from the publisher, bearing a printed copy of the notice, reciting the character of the publication, frequency of issue, and that it is of general circulation in the county, and showing that thirty full days elapsed after the paper containing the notice first appeared and before the meeting.

This meeting when held is in the hands of the corporators, not of the subscribers. The corporators choose the chairman and secretary of the meeting and are inspectors of the election. After reading the aforementioned notice and the affidavit of the publisher, the chairman should announce that the object of the meeting is to elect not less than three directors. He should then ask the meeting to decide how many directors are to be chosen. A motion designating the number is the proper procedure. The number having been decided on the meeting should proceed to elect them. In this election each stock subscriber who attends in person, or by proxy signed by him, is entitled to one vote for each share subscribed by him. No one is eligible to the office of director unless he is a stockholder (or in this case, a subscriber to the stock).

After the election of directors the corporators should sign a certificate stating who has been elected, and should announce the time and place for the first meeting of the directors. It will usually be of advantage to have the directors meet immediately after adjournment of the meeting at which they are elected. The corporators' certificate of this election should be kept among the permanent files of the association. It would be well to adopt by-laws at the same meeting of stock subscribers. These should of course provide for the same number of directors that the meeting has decreed. Adjournment of the stock subscribers' meeting ends the responsibility of the three corporators. Thereafter the affairs of the association are in the hands of the directors. The latter should not forget that, before entering upon the discharge of their duties, each must take and subscribe an oath faithfully and honestly to discharge his duties as director. The oath should be acknowledged before a notary and kept among the files of the association.

The officers are chosen by the directors at their first meeting after taking the above mentioned oath. The president must be a director, but a secretary may be appointed from outside the board. Both these officers should have sufficient interest in the success of the undertaking to serve without pay. Their gratuitous service can be greatly lightened by the exercise of a little consideration on part of the stockholders, in not insisting on or expecting unnecessary communications to be sent out upon every occasion. In an organization of this kind, the manager is the only person to whom it is necessary to pay a salary. He is not an officer, but an employee. The duties of secretary are confined to keeping a record of board meetings, signing occasional documents, and issuing various notices at stated intervals. As the latter are usually printed, the duties of the office are not so heavy that some fruit-grower will not be willing to perform them without compensation.

The following letter received by the writer will be of interest as reinforcing some of the points made in this article, and as showing the varied possibilities and rapid and healthy expansion of the fruit industry, under the stimulus of a well-organized and prudently managed association:

Eugene, Oregon, October 26, 1912.

MR. H. C. ATWELL, Forest Grove, Oregon.

DEAR SIR: I have yours of the 23d asking what we are doing and how we are doing it. It is too early in the season to give you a complete statement of this season's business, as we are yet running full blast, packing apples, canning pumpkin, apples, squash, tomatoes and sauer-kraut. We expect to keep running up to about December 1st; in fact we are busy in one or more departments the year round. Our buildings cover about thirty thousand square feet of floor space, consisting of a green fruit packing department, a cannery, an evaporator, and a spray factory. These departments are so arranged that fruit may be easily transferred from one to the other. During the winter and spring months we make from four to six hundred barrels of lime-sulphur spray. The cannery begins on asparagus, beets, gooseberries and strawberries, in May, and following the fruits and vegetables in season, finishes up late in the fall with pumpkin, kraut, etc. When this season's pack is finished it will be somewhat in excess of sixteen thousand cases, consisting of twenty-eight varieties of fruits and vegetables, put up in sixty-nine different styles and grades. The fresh fruit department attends to the grading, packing and shipping of the various fruits from strawberries to apples. The cannery is always at hand to take any surplus or over-ripe fruit from this department. Our evaporator has a capacity of eight hundred boxes of fruit every twenty-four hours.

This association is now completing the fourth year of its existence. We have grown steadily from the beginning. At the end of the first season the manager reported ninety-four stockholders and a paid up working capital of $756. At present we have 250 members and a paid in capital of nearly twenty thousand dollars. It is our policy to add any department or handle any article needed by the membership just as soon as it appears to be good business to do so. It is our rule that each department must not only pay its own running expenses, but a share of the overhead expenses as well. Our association is the manufacturing and sales end of some 250 fruit and vegetable farms. Not only this but each member is entitled to buy any article handled or manufactured here at wholesale prices. Perhaps one of the most important phases of our work is to discourage indiscriminate planting of varieties, many of which are unsuited to our soil and climatic conditions, and for which there appears to be no substantial market. We have the hearty co-operation of our members, are sound financially, and are doing our best to keep pace with the wonderful growth of the upper Willamette Valley.

Sincerely yours,
J. O. Holt, Manager,
Eugene Fruit Growers Association.

As requested, I append hereto the by-laws of the Forest Grove association. They embody the principles I have attempted to set forth in this article. Aside from the merely formal provisions incident to all organizations of this character, they contain, it is believed, the most useful features from the most successful association on the Pacific Coast.

ARTICLES OF INCORPORATION, FOREST GROVE FRUIT GROWERS ASSOCIATION.

Know All Men by These Presents:

That we, H. C. Atwell, A. B. Craft and Robert Alexander, each being a citizen of Washington County, in the State of Oregon, and being desirous of forming a corporation under the laws of Oregon, for the purposes hereinafter set forth, do hereby associate ourselves together as a corporation under said laws, and to that end do hereby make, subscribe and adopt these Articles of Incorporation, in triplicate, as follows, to-wit:

Article 1. The name assumed by this corporation, and by which it shall be known, is "Forest Grove Fruit Growers Association".

Article 2. The duration of the corporation shall be fifty years from the date hereof.

Article 3. The object and purpose of this corporation, and the business in which it proposes to engage, are to encourage and promote fruit and vegetable growing and farming; to buy, sell, ship, handle, store, pack, process, cure, preserve and can fruit, vegetables and other farm products, and any articles manufactured therefrom, and to manufacture food products from the same; to buy, sell, manufacture, ship and deal in orchard and farm supplies, and all articles and materials necessary or proper to be used in or about, or in connection with, its business; and to do all things necessary or pertinent to the conduct of its business, in any and all its departments.

Article 4. The principal office and place of business of this corporation shall be at Forest Grove, Oregon.

Article 5. The capital stock of the corporation shall be five thousand dollars, divided into two hundred and fifty shares of twenty dollars each.

In witness whereof we have hereunto subscribed our names, and executed these articles, in triplicate, this twenty-ninth day of April, 1912.

In the presense of
W. W. McEldowney,
H. E. Ferrin.

H. C. Atwell,
A. B. Craft,
Robert Alexander.

COUNTY OF WASHINGTON, } ss.
State of Oregon. }

I, W. W. McEldowney, a notary public in and for the above named county and state, do hereby certify that, on this 29th day of April, 1912, personally appeared before me H. C. Atwell, A. B. Craft and Robert Alexander to me known to be the individuals described in, and who signed and executed, the foregoing articles of incorporation; and that each of said persons acknowledged to me that he signed and executed the same as his free and voluntary act and deed, and for the uses and purposes therein mentioned.

Given under my hand and official seal, this 29th day of April, 1912.

W. W. McEldowney,
Notary Public for Oregon.

[SEAL]

BY-LAWS OF FOREST GROVE FRUIT GROWERS ASSOCIATION OF FOREST GROVE.

Adopted at a special meeting of the stockholders, called for that purpose, and held at Forest Grove, Oregon, July 2, 1912.

Article 1. *Limitation on Stockholding.*—No one shall be permitted to own more than twenty-five shares of stock. This provision shall be printed on the certificates of stock.

Article 2. *Transfer of Stock.*—1—Shares of stock must be transferred on the books of the association, upon surrender to the secretary of the outstanding certificate for cancellation, and upon the signing of such transfer, in the regular stock transfer book of the association, by the stockholder in person or through attorney. Thereupon a new certificate shall be issued to the person to whom such transfer is made. If transfer is made through attorney, authority therefor, signed by the stockholder, shall be filed with the secretary. 2—Whenever any stockholder ceases to be an actual fruit-grower or farmer, it shall be the duty of the board of directors, upon learning that fact, to make written request upon such stockholder to surrender his certificate or certificates to the association. The board shall thereupon have 20 days in which to find a purchaser for said stock, or may themselves purchase it in trust for the association. No sale or transfer of stock shall be valid until the directors have had 20 days in which to exercise their option to purchase the same. These provisions shall be printed on the certificate of stock.

Article 3. *Stockholders Meetings.*—1—The annual meeting of stockholders for election of directors shall be held at the office of the association, in Forest Grove, Oregon, at ten o'clock a. m., on the second Saturday in January of each year. 2—Notice of annual meetings shall be given by the secretary, by mailing it to the last known address of each stockholder, and by publishing it in some weekly newspaper of general circulation, published in Forest Grove, at least ten days before the date of said meeting. Said notice shall state the place, hour, day and purpose of said meeting, and shall be signed by the president and secretary.

2. Special meetings of the stockholders shall be held at the office of the association, in Forest Grove, Oregon. Such meeting may be called by the president, at any time and for any purpose, when in his judgment the interests of the association may demand it, upon giving the notice provided for hereafter. He shall call such meeting, when requested to do so by a majority of the directors or by a petition filed with the secretary, and signed by one-third the capital stock, stating the purpose for which the meeting is desired, in which case like notice shall be given.

4. Notice of special meetings shall be signed by the president and secretary, and shall be given by the secretary by mailing a copy thereof at least five days before the date of said meeting, to the last known address of each stockholder. Said notice shall state the place, hour, day and purpose of said meeting. No business shall be transacted at any special meeting, unless said business has been fully set forth in such notice.

5. *Quorum.*—A quorum for the transaction of business, at any stockholders' meeting, shall consist of stockholders, or their proxies, representing a majority of the capital stock; but a lesser representation may adjourn to another date.

ARTICLE IV.—Voting at Stockholders Meetings.

1. *Voting Power of Shares.*—At all stockholders meetings, each stockholder, either in person or by proxy, shall be entitled to one vote for each share of paid up stock which he owns, as shown by the books of the association.

2. *Form of Ballot.*—All ballots cast at the election of directors shall have written thereon the names of the persons selected by the voter, the number of votes intended to be cast for each, the name of the owner of the shares being voted, and the name of the proxy if any.

3. *Voting by Proxy.*—The stockholder who wishes to exercise his right to vote his stock by proxy must furnish his agent or attorney with written authority to cast his vote. Such authority, or proxy, shall be filed with the secretary, at least one hour before time for such meeting to convene. It shall be preserved by the secretary for one year, but shall be valid only for that meeting.

4. *Tellers at Annual Meetings.*—At election of directors, the stockholders shall appoint a committee to receive the ballots, and the committee, together with the secretary, shall count the ballots and report the results to the president, who shall announce the same.

5. *Proportion of Vote Necessary to Elect.*—A majority of the stock represented at any meeting shall be sufficient to elect, or to carry any measure.

ARTICLE V.—Directors—Their Powers and Duties.

1. *Number.*—The affairs of the association shall be conducted by a board of nine directors chosen by the stockholders at their annual meeting.

2. *Eligibility.*—No one shall be eligible to the office of director who is not, at time of his election, an actual fruit grower or farmer.

3. *Election of Officers.*—The directors shall meet immediately after the annual stockholders' meeting, at which they are elected, and choose from their own number a president, a vice-president, and a treasurer, and shall also, at the same time, appoint a secretary. Said officers shall also hold office at the pleasure of the Board, and until their successors are elected and qualified, and shall perform such duties, in addition to those hereinafter set forth, as the Board may prescribe.

4. *Compensation of Officers.*—No officer or director shall receive a salary or per diem, unless he shall also be authorized by the Board to act as manager, in which case his salary shall be fixed by the Board. *Provided, however*, that any officer or director shall be entitled to reim-

bursement for any expense incurred by him in transacting business authorized by the Board. *Provided, also,* that this section shall not debar a director from receiving per diem as a member of the auditing committee hereinafter mentioned.

5. *Executive Committee.*—The directors may choose two of their number who with the president, shall constitute an Executive Committee, which committee shall have such power, duties and authority as may be expressly designated in the resolution appointing such committee.

6. *Appointment of Subordinates.*—The directors shall appoint such agents and employees as they may deem expedient, and may remove them at pleasure. They shall fix the compensation and prescribe the duties of those thus appointed, and see that these duties are properly performed. This section shall not be construed to prohibit granting authority to the person who may act as manager to employ and discharge such subordinates.

7. *Employment of Relatives.*—The directors shall not permit anyone having authority to hire help to employ any person who is related to him within the third degree, without the concurrence of a majority of the Board, by a vote duly entered on the secretary's record.

8. *Manager.*—If the directors employ a manager, they shall give him authority to employ and discharge help, and shall as occasion demands set aside for his use a specific sum of money, against which he shall be empowered to draw checks, in payment for wages, products, supplies, and other expense of conducting the business of the association. In that case the directors shall instruct the treasurer to place the sum stated to the credit of the manager as such; and shall require said manager to render to them a monthly statement showing all disbursements made by him.

9. *Vacancies in the Board.*—Shall be filled by a majority vote of the remaining directors at any regular meeting of the Board. The persons chosen to fill such vacancies shall hold office until their successors are elected and qualified.

10. *Regular and Special Meetings.*—The Board of Directors shall meet regularly, at ten o'clock a. m., on the first Tuesday of each month. Special meetings may be called at any time by the president and secretary, and must be so called upon written request of a majority of the directors. Notice of such special meetings shall be personally served upon each director, at least twenty-four hours before the time of such meeting, or by mailing a copy of said notice to the last known address of each director, at least three days prior to said meeting, which notice shall state the time, hour and place of said meeting, and shall be signed by the president and secretary, or by someone acting in their stead during their absence or disability.

Any business transacted by any or all the directors, outside a regular meeting, or a special meeting called as herein provided, shall be invalid, unless the same shall be ratified at the next regular meeting of the Board, by a majority vote thereof. This provision is not intended to apply to the Executive Committee, acting as such, nor to any director who may also be an officer, and acting in discharge of his official duty.

11. *Quorum at Directors' Meeting.*—A quorum shall consist of a majority of the directors, but a less number may adjourn to a subsequent date.

12. The directors shall cause certificates of stock to be issued to the stockholders, in proportion to their several stockholdings.

13. *Keeping a Check Register.*—The directors shall cause to be kept a check register, in which shall be entered, in the order of their drawing, a list of all checks drawn on association funds, to whom and for what purpose drawn, and when paid.

14. *Purchase of Power Sprayers.*—The directors may procure one or more power sprayers, for use in the community, and may provide for their operation, on such terms as shall save the association from expense for such operation.

15. *Incurring Indebtedness.*—The Board of Directors shall not, without special authority from the stockholders, sell any real estate belonging to the association, nor mortgage any of its property. They may however incur any indebtedness which may seem necessary in conducting the business of the association. The authorization of such expenditure shall be entered on the minutes of the Board, and the evidences of such indebtedness shall be signed by the president and countersigned by the secretary, and shall be binding on the association.

16. *Appropriation for Trips.*—The Board may appropriate not to exceed fifty dollars, in any year, toward expenses of visiting other like associations, or toward defraying expenses of experts or of representatives of other associations whom they may wish to visit this association. Any director or other stockholder who may be selected to visit other associations shall, upon his return, file with the secretary a detailed account of his observations and conclusions during such visit.

17. *Rules for Grading, Packing, Etc.*—The directors shall have power to make rules relative to picking, grading, handling and packing the products of its members, and to exercise the option of refusing to handle or purchase any products not conforming to such requirements, or of causing the same to be re-graded or re-packed at expense of grower, for which expense the association shall have a lien on such products and on their proceeds.

18. *Monthly Audit.*—The directors shall appoint a committee of three, one of whom shall be a director and two of whom shall be stockholders other than directors, whose duty shall be to make a monthly checking of the books and accounts of the association, and to render a monthly report thereof to the Board. For each such report each of said committee shall receive one dollar.

19. *Marketing Contracts.*—In order that the directors may be able intelligently to estimate the amount of supplies necessary for the ensuing year, and work to advantage in making sales, they shall require all stockholders wishing the association to handle any or all their products to sign contracts to that effect. Said contracts shall cover the entire crop of the product therein specified and shall remain in force from year to year, unless canceled during the month of January, which provision shall be recited in the contract. Said contract shall be in form as set forth at the end of these by-laws.

20. *Handling for Non-Stockholders.*—The directors shall not handle the product of non-stockholders, nor shall it handle for a member any product not covered by the contract just referred to. Nothing herein contained shall prevent the directors from buying the products of members of the association or of non-members, whenever they shall consider it advisable and profitable to do so.

21. *Definition of Handling.*—The phrase "handling", as used in these by-laws, applies to all cases where products are not bought on the market for cash, and with the idea of profit to the association.

22. *Pooling.*—The directors may make rules governing the sale of members' fruit in groups, commonly called pools, and governing the distribution of the proceeds of such sales.

23. *The Handling Charge.*—The association shall charge a commission of not to exceed ten per cent for their services to members in handling and selling their product. Said commission shall be called the handling charge, and shall be deducted from the proceeds due growers for such

products, after deducting all expenses accruing against said products after delivery to the association.

24. *Refund of the Handling Charge.*—Out of said handling charge, a sum, not to exceed twenty per cent of the same, shall be set aside as a reserve fund, to be used as the needs of the business require, but not for current expenses. At stated intervals, as often as once a year, the remainder of said handling charges, after also deducting a sum sufficient to pay the expenses of conducting the business, including a dividend of not to exceed six per cent on the stock, shall be distributed among the members whose products were handled, in proportion to the proceeds received by them during the year, for their products.

25. *Collecting Stock Subscriptions.*—The directors shall make calls upon subscriptions to the capital stock, until the same shall be fully paid, said calls to be timed in accord with the terms of subscription. All calls shall become delinquent, after thirty days from the time the same shall become due under the call. Said stock shall then be declared, and shall become, delinquent and forfeited to the association.

26. *Annual Audit by Expert.*—The directors shall cause the books and accounts of the association to be audited, once each year, by a competent accountant, not connected with the association in any capacity. His report shall be filed with the secretary, ten days before the annual stockholders' meeting.

27. *Report at Annual Meeting.*—The directors shall cause to be kept a complete record of all their meetings and transactions. They shall present a complete summary thereof at the annual meeting of stockholders, showing in detail the assets and liabilities and general condition of the association, showing also the amount of each fruit and farm product handled, and the dispositions made of the same.

28. *Reports at Special Meetings.*—They shall present a similar report, at any other stockholders' meeting, when requested so to do, in a written request, signed by a majority of the stock, and filed with the secretary not less than five days before such meeting.

ARTICLE VI.—Officers and Their Duties.

1. *President.*—The president shall preside over all meetings of the stockholders, directors and executive committee. He shall be, ex-officio, a member of all other committees. He shall sign all certificates of stock, evidences of indebtedness, contracts and other instruments in writing, and all orders on the treasurer for disbursement of any association funds. He shall sign all calls for stockholders' and directors' meetings, and shall have, subject to the advice of the directors, general supervision and management of the affairs of the association. He shall discharge such other duties as generally devolve upon a president.

2. *Vice-President.*—The vice-president shall perform all the duties of the president during the latter's absence or inability to act.

3. *President Protem.*—In case both the president and vice-president shall be temporarily unable to act, the Board of Directors shall appoint from their own number some person to act as president protempore, whose duties shall be to perform the functions of the president during such temporary inability.

4. *Secretary.*—The secretary shall keep an accurate account of the proceedings of the stockholders and of the directors. He shall keep the corporation seal, records and papers of the corporation, fill and countersign all certificates of stock issued, and make the corresponding entry in the stub of the stock book, and shall affix the corporate seal to all papers requiring the same. He shall countersign all orders on the treasurer for disbursement of corporate funds, and discharge such other duties as pertain to his office.

The books and papers of the association shall be open to inspection of any stockholder, at all times during business hours, every day except Sundays and legal holidays.

5. *Treasurer.*—The treasurer shall receive, hold and account for all funds of the association, and pay them out only on the order of the president, countersigned by the secretary. At each annual meeting of stockholders, he shall submit a complete statement of his accounts for the past year, with proper vouchers for disbursements made, and shall perform such other duties as pertain to the office of treasurer.

6. Every officer or employee having the handling of funds shall be required to give bonds, in such sum as the Board may direct, conditioned upon the faithful discharge of their duties.

Article VII.—Amendments.

These by-laws may be amended at any annual meeting of the stockholders, or at any special meeting of the stockholders called for that purpose, provided that for such special meeting the same notice shall be given as is required for the annual meeting. Provided further that the substance of the proposed by-law shall be set forth in all such notices.

Strawberry Field of J. E. Stansbery—Portland.

LOGANBERRY AND BLACKBERRY CULTURE.

By J. E. STANSBERY, *County Fruit Inspector for Multnomah County.*

THE LOGANBERRY.

The first thing to be considered in loganberry culture is the soil, which should be ferterlized with barnyard manure. Manure, while being saved, should be kept under roof and all liquid manure added, so as to furnish about equal parts of nitrogen and potash which will insure a good growth of vine and fruit. Plow deep in the fall before planting and as soon as possible; then give second plowing in the spring; harrow until the soil is thoroughly pulverized.

Select strong plants, and plant 8 or 10 feet between rows and 7 to 8 feet between plants in row. Cultivate thoroughly and keep ground free of weeds. The vines will spread out over the ground and be troublesome in cultivation. To avoid this trouble the vines may be trained in rows and stakes 18 inches long used to keep them out of the way of the cultivator and also from injury, as these vines bear the next year's fruit.

Posts 8 feet long, set in the ground 2 feet deep, should be set every 24 feet where posts are scarce and pickets made out of lumber 1x3 inches may be used between posts. Place the posts closer where they are cheap.

Use No. 9 wire for trellis. Use two wires and place first wire near the top of post and second wire 2 feet below first wire. The wire must be tightly strung and secured to posts. End posts must be well braced.

Six or eight of the best vines should be selected and cut back within 6 or 7 feet of ground and tied with cotton twine to wire cables, tieing them on wire in fan shape, leaving space between vines so light and air can reach fruit. This also makes gathering fruit easier. This method insures large fruit for local markets. Cut remaining vines close to ground. This work in a mild climate may be done from October to March. I would not advise tying up new vines before March where the climate is severe, as cold very often causes the vines to winter-kill.

Cultivate thoroughly and often to retain moisture until fruit is ready to market. After fruiting season is over remove old vines and burn. In September you can prepare to propagate plants for sale or planting by placing on tip of young growth a shovel full of dirt or dig a shallow hole and place tip in and cover with soil.

The phenomenal berry is grown in the same way as the loganberry.

THE BLACKBERRY.

The preparation of soil for blackberries is the same as for loganberry culture, giving the blackberry lower ground, which must, however, be well drained.

The blackberry may be divided into classes, the cane and vinous. There are several varieties of each.

The vinous or vine blackberry is grown like the loganberry; also propagated the same and the same methods in pruning and tying young growth to wires are used.

The cane berry is planted in rows from 8 to 10 feet apart and 4 to 5 feet in row, which planting should be done in the spring. Cultivate thoroughly and keep free from weeds.

Posts can be placed every 15 feet; use eight-foot posts set 2 feet in ground. Use a cross piece 1 foot long of 1x3 lumber four feet from the ground. Place two No. 9 wires to the row; fastened securely to ends of cross pieces so as to keep same inside of wires. Use a piece of No. 9 wire 9 inches long with a hook bent on each end between plants to keep wires the right distance apart. Keep canes upright and support the main cables.

When canes attain 5 feet in height prune or pinch tips off and keep canes inside of wires. This will force laterals which will keep fruit where it can be gathered. In rich, moist soil laterals may be pruned back.

Blackberries must be thoroughly cultivated to retain moisture as they ripen late in season when it is naturally hot and dry.

When through fruiting cut old canes out and burn them.

The blackberry is propagated by suckers from the roots.

REPORT FROM CLACKAMAS COUNTY.

By O. E. FREYTAG, *County Fruit Inspector for Clackamas County.*

To the Honorable State Board of Horticulture—

I herewith respectfully submit report from Clackamas County. I find some varieties of fruit crop short, especially so are the Italian prunes, which represent in a large measure the present fruit industry of Clackamas County. Pears are about a half crop, while other fruits are nearly a full crop. Grapes are very full and promise to ripen early.

Pruning and spraying of orchards has been very satisfactory, however, in a few cases the owners of old trees were slow about the work. The results are now in evidence for some have sprayed all the orchards with arsenic of lead and have good clean fruit, while others sprayed only in part, and the result of spraying is seen in every case. It will make the work much easier in the future. In Clackamas County we have many old orchards which are a source of nuisance to all who wish to grow new orchards, and it is with difficulty that the owners of these old trees are persuaded to clean up or cut down these old troublesome spots. It has a tendency to retard the planting out of new orchards, because one gets the idea fruit does not do so well, but that is not the case. Apples, as good as any grown in the State, are grown in Clackamas County, but the same care must be given them, that they receive in a more developed fruit section and where apple-growing is made a study. Promising sections in the county are Garfield, Sandy, Dover and Cherryville in the eastern portion of the county. And then again in the Molalla section and Scotts Mill, in fact all of the hilly country east of the Willamette produces a good quality of fruit and almost a sure crop on account of immunity from killing frosts. In these new fruit sections the spray pump is constantly at work and pests and fungous diseases are kept out, and the trees are handsomely clean. Growers take pride in their trees, expecting in another year or two to harvest beautiful crops of apples and other fruit.

UMATILLA COUNTY AND THE MILTON FRUIT GROWERS' UNION.

By S. J. CAMPBELL, *Fruit Inspector for Umatilla County.*

The fruit-growing industry in the Umatilla County portion of the Walla Walla valley has increased rapidly in the past few years. The old orchards have been pruned, sprayed and cultivated so that most of them are now bearing fine fruit. New commercial orchards have been planted which are in up-to-date condition.

A few years ago growers were much discouraged by market conditions and prices of fruit. Prices were low and most of the fruit was sold at home. There has been great improvement in methods of marketing since that time. The Walla Walla valley has as few drawbacks as any fruit district in the northwest.

In addition to the Walla Walla valley we have a number of other ideal places for growing fruit in Umatilla County. Weston has the

soil and climatic conditions to enable it to grow the apple with profit. Hermiston and Stanfield, new fruit-growing districts, are beginning to get results.

Better work in spraying for San Jose scale has never before been done in the county than in the past year. The fruit grown in the county the past year has been remarkably clean and free from scale and worms. The growers are fast learning that it pays to produce fruit of the best quality and are using the methods which produce such fruit.

THE MILTON FRUIT GROWERS' UNION.

The Milton Fruit Growers' Union of Milton and Freewater is the inspiring cause of the production of cleaner fruit and the obtaining of better prices. It was organized in 1901 and the capital stock was $2,000. Fairly good results were obtained from the start and from year to year its opponents grew weaker and the union stronger. With the growth of business it became advisable in 1908 to increase the capital stock to $10,000 and to erect a two-story building and basement, 40 by 80 feet. Capital and building were not fully adequate to handle the business in 1911, and in 1912 the capital stock was increased to $20,000 and a good building was erected at State line on the interurban railroad.

The value of the fruit handled by the union in 1911 was $185,000. This year the union has shipped 75 cars of peaches, 40 cars of cherries, nearly 200 cars of prunes, and will handle over 350 cars of apples. In addition to handling all this fruit the union handles vegetables, hay, wood and coal for the benefit of its members and pays a dividend of 10 per cent on its capital stock. We hope to profit by the experience of each season's profits and losses and make the union a steadily growing factor in advancing the prosperity of this section.

PRUNES EXPORTED FROM AND IMPORTED INTO THE UNITED STATES.

The quantities of prunes imported into the United States and the quantities exported from the United States for the fiscal years ending with June 30th for the years mentioned below have been:

Year—	*Imports, pounds.*	*Exports, pounds.*
1891	34,281,322	Not segregated
1895	14,352,057	Not segregated
1898	303,992	15,940,791
1899	600,360	5,615,565
1900	443,457	25,922,371
1901	745,974	10,021,564
1902	522,478	23,358,849
1903	633,819	66,385,215
1904	494,105	73,146,214
1905	671,604	54,993,849
1906	497,494	24,869,744
1907	323,377	44,400,104
1908	335,089	28,148,450
1909	296,123	22,602,288
1910	Not segregated	89,014,880
1911	Not segregated	51,030,711
1912	Not segregated	74,328,074

IMPORTS OF WALNUTS INTO UNITED STATES.

Fiscal years ending June 30—	Pounds.
1903	12,362,567
1904	23,670,761
1905	21,684,104
1906	24,907,028
1907	32,597,592
1908	28,887,110
1909	26,157,703
1910	33,641,466
1911	33,619,434
1912	37,213,674

ESTIMATED PRODUCTION OF WALNUTS IN CALIFORNIA.

(From California Fruit Grower.)

Year—	Tons walnuts.	Year—	Tons walnuts.
1898	5,650	1905	6,400
1899	5,580	1906	7,000
1900	5,430	1907	7,400
1901	6,900	1908	9,200
1902	8,570	1909	9,350
1903	5,500	1910	8,500
1904	7,590	1911	12,500
		1912	11,000

EXPORTS OF APPLES FROM THE UNITED STATES.

Fiscal year—	Fresh barrels	Dried pounds.
1905-06	1,208,989	27,852,831
1906-07	1,539,267	45,697,948
1907-08	1,049,545	24,237,873
1908-09	896,279	33,474,634
1909-10	922,078	25,076,618
1910-11	1,721,106	21,804,086
1911-12	1,456,381	53,664,639

PRODUCTION OF APPLES IN THE UNITED STATES—CENSUS OF 1910.

	Trees Reported April 15, 1910		Products of 1909	
	Of Bearing Age, No. (thousands)	Not of Bearing Age, No. (thousands)	Bushels (thousands)	Value (thousands)
United States	151,323	65,792	147,522	$ 83,231
NEW ENGLAND				
Maine	3,477	1,045	3,636	2,122
New Hampshire	1,241	207	1,108	638
Vermont	1,184	220	1,460	752
Massachusetts	1,367	356	2,550	1,780
Rhode Island	152	55	213	147
Connecticut	799	212	1,541	833
MIDDLE ATLANTIC				
New York	11,248	2,829	25,409	13,343
New Jersey	1,054	520	1,407	956
Pennsylvania	8,000	2,501	11,048	5,558
EAST NORTH CENTRAL				
Ohio	8,505	2,438	4,664	2,971
Indiana	5,765	1,962	2,759	1,721
Illinois	9,901	2,548	3,093	2,112
Michigan	7,534	2,253	12,332	5,969
Wisconsin	2,430	1,409	2,232	1,897
WEST NORTH CENTRAL				
Minnesota	1,380	1,572	1,044	769
Iowa	5,847	1,914	6,747	3,551
Missouri	14,360	3,625	9,969	4,886
North Dakota	16	70	4	7
South Dakota	275	461	192	159
Nebraska	2,937	967	3,321	1,613
Kansas	6,930	1,116	1,356	808
SOUTH ATLANTIC				
Delaware	430	264	183	115
Maryland	1,288	661	1,823	902
District of Columbia	2		3	2
Virginia	7,005	3,436	6,104	3,130
West Virginia	4,571	2,772	4,225	2,461
North Carolina	4,910	1,835	4,776	2,015
South Carolina	582	269	363	276
Georgia	1,878	822	896	556
Florida	8	6	3	4
EAST SOUTH CENTRAL				
Kentucky	5,538	2,106	7,368	3,067
Tennessee	4,839	2,117	4,640	2,172
Alabama	1,468	738	888	621
Mississippi	428	425	266	214
WEST SOUTH CENTRAL				
Arkansas	7,650	3,940	2,296	1,323
Louisiana	93	97	34	29
Oklahoma	2,956	2,060	742	573
Texas	1,139	1,128	168	161
MOUNTAIN				
Montana	697	1,308	567	567
Idaho	1,006	1,540	660	611
Wyoming	28	84	18	38
Colorado	1,688	1,973	3,559	3,405
New Mexico	543	914	417	421
Arizona	62	54	73	109
Utah	517	789	350	320
Nevada	74	17	74	66
PACIFIC				
Washington	3,009	4,863	2,672	2,926
Oregon	2,030	2,241	1,931	1,657
California	2,483	1,054	6,335	2,902

PRODUCTION OF PEARS IN THE UNITED STATES—CENSUS OF 1910.

	Trees Reported April 15, 1910		Products of 1909	
	Of Bearing Age, No. (thousands)	Not of Bearing Age, No. (thousands)	Bushels (thousands)	Value (thousands)
United States	15,172	8,804	8,841	$ 7,911
NEW ENGLAND				
Maine	47	13	39	44
New Hampshire	37	9	24	25
Vermont	26	8	21	24
Massachusetts	113	38	96	110
Rhode Island	17	5	13	15
Connecticut	57	24	41	42
MIDDLE ATLANTIC				
New York	2,142	1,503	1,343	1,418
New Jersey	732	238	463	255
Pennsylvania	797	382	379	356
EAST NORTH CENTRAL				
Ohio	899	334	375	333
Indiana	709	230	320	244
Illinois	786	234	249	203
Michigan	1,136	624	666	536
Wisconsin	30	20	13	17
WEST NORTH CENTRAL				
Minnesota	3	4		
Iowa	191	123	44	59
Missouri	607	272	143	149
North Dakota				
South Dakota	2	5		
Nebraska	59	51	7	10
Kansas	292	133	19	22
SOUTH ATLANTIC				
Delaware	450	91	105	52
Maryland	541	138	367	169
District of Columbia	1			
Virginia	457	255	74	63
West Virginia	155	103	30	32
North Carolina	243	150	84	81
South Carolina	105	55	66	68
Georgia	263	70	150	135
Florida	111	19	98	80
EAST SOUTH CENTRAL				
Kentucky	337	132	252	188
Tennessee	233	175	84	78
Alabama	142	99	100	87
Mississippi	119	101	101	97
WEST SOUTH CENTRAL				
Arkansas	222	197	38	38
Louisiana	58	38	36	31
Oklahoma	207	252	7	9
Texas	558	449	111	114
MOUNTAIN				
Montana	10	13	8	12
Idaho	65	77	43	48
Wyoming		1		
Colorado	100	171	133	211
New Mexico	37	100	29	30
Arizona	16	13	13	21
Utah	79	40	39	44
Nevada	4	2	4	5
PACIFIC				
Washington	291	618	311	329
Oregon	274	796	375	367
California	1,411	398	1,928	1,661

PRODUCTION OF CHERRIES IN THE UNITED STATES, 1909.

Division or State	Trees of bearing age, 1910. Number of trees	Products of 1909	
		Bushels	Value
United States	11,822,044	4,126,099	$ 7,231,160
STATES.			
California	522,304	501,013	951,624
Illinois	843,283	287,376	453,474
Indiana	815,742	363,993	508,516
Iowa	908,764	260,432	455,022
Michigan	760,183	338,945	590,829
New York	673,989	271,597	544,508
Ohio	1,144,271	338,644	657,406
Oregon	223,456	181,089	269,934
Pennsylvania	1,075,031	475,093	909,975
Virginia	352,783	132,671	134,428
All other states	4,502,238	975,246	1,755,444

PRODUCTION OF PLUMS AND PRUNES IN THE UNITED STATES, 1909.

Division or State	Trees of bearing age, 1910. Number of trees.	Products of 1909	
		Bushels	Value
United States	23,445,009	15,480,170	$ 10,299,495
STATES.			
Arkansas	731,276	194,649	137,003
California	7,168,705	9,317,979	5,473,539
Idaho	302,855	179,027	132,804
Michigan	464,917	181,188	205,765
Missouri	917,851	234,872	211,472
New York	919,017	553,522	519,192
Ohio	1,001,734	215,657	278,505
Oregon	1,764,896	1,747,587	838,783
Pennsylvania	744,148	295,158	396,005
Washington	823,082	1,032,077	600,503
All other states	8,606,528	1,528,454	1,505,924

PROHIBITING SALE OF MISBRANDED INSECTICIDES AND FUNGICIDES.

Be it enacted by the People of the State of Oregon:

Section 1. That it shall be unlawful for any person, or persons, firm or corporation, to manufacture within the State of Oregon, any insecticide, Paris green, lead arsenate, or fungicide which is adulterated or misbranded within the meaning of this act, for use or sale within or without the State of Oregon; and any person who shall violate any of the provisions of this section shall be guilty of a misdemeanor, and shall, upon conviction thereof, be fined not less than fifty dollars ($50) nor more than two hundred dollars ($200) for the first offense, and upon conviction for each subsequent offense be fined not less than one hundred dollars ($100) nor more than three hundred dollars ($300), or sentenced to imprisonment in the county jail for not less than thirty days nor more than ninety days for the first offense, and not less than ninety days for the second offense, upon conviction, nor more than six months, or both such fine and imprisonment, in the discretion of the court.

Section 2. That it shall be unlawful for any person or persons, firm or corporation, to sell, or offer for sale, within the State of Oregon, any insecticide, Paris green, lead arsenate, or fungicide which is adulterated or misbranded within the meaning of this act; and any person or persons, firm or corporation, who shall violate any of the provisions of this section shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be fined or imprisoned, or both, as is provided in Section 1 of this act.

Section 3. That the examination of specimens of insecticides, Paris green, lead arsenates, and fungicides shall be made by the chemist of the Oregon Agricultural College, at Corvallis, Oregon, or the State Board of Health, at Portland, Oregon, or by the chemist of the University of Oregon, at Eugene, Oregon, for the purpose of determining from such examination whether such article or articles are adulterated or misbranded within the meaning of this act; and if it shall appear from any such examination that any of such specimens are adulterated or misbranded within the meaning of this act, it shall be the duty of the prosecuting attorney within the district where the offense is committed to institute proper criminal proceedings against any person or persons, firm or corporation, so manufacturing, selling or offering for sale any such misbranded, adulterated or fraudulent article as set forth in Sections 1 and 2 of this act.

Section 4. That the term "insecticide" as used in this act shall include any substance or mixture of substances intended to be used for preventing, destroying, repelling, or mitigating any insects which may infest vegetation, man or other animals, or households, or be present in any environment whatsoever. The term "Paris green" as used in this act shall include the product sold in commerce as Paris green and chemically known as the aceto-arsenite of copper. The term "lead arsenate" as used in this act shall include the product or products sold in commerce as lead arsenate and consisting chemically of products derived from arsenic acid (H_3AsO_4) by replacing one or more hydrogen atoms by lead. That the term "fungicide" as used in this act shall include any substance or

mixture of substances intended to be used for preventing, destroying, repelling, or mitigating any and all fungi that may infest vegetation or be present in any environment whatsoever.

Section 5. That for the purpose of this act an article shall be deemed to be adulterated—

In the case of Paris green: *First.*—If it does not contain at least fifty per centum of arsenious oxide; *second,* if it contains arsenic in water-soluble forms equivalent to more than three and one-half per centum of arsenious oxide; *third,* if any substance has been mixed and packed with it so as to reduce or lower or injuriously affect its quality or strength.

In the case of lead arsenate: *First,* if it contains more than fifty per centum of water; *second,* if it contains total arsenic equivalent to less than twelve per centum of arsenic oxide (As205); *third,* if it contains arsenic in water-soluble forms equivalent to more than seventy-five one hundredths per centum of arsenic oxide (As205); *fourth,* if any substances have been mixed and packed with it so as to reduce, lower, or injuriously affect its quality or strength; *provided, however,* that extra water may be added to lead arsenate (as described in this paragraph) if the resulting mixture is labeled lead arsenate and water, the percentage of extra water being plainly and correctly stated on the label.

In the case of insecticides or fungicides, other than Paris green and lead arsenate: *First,* if its strength or purity fall below the professed standard or quality under which it is sold; *second,* if any substance has been substituted wholly or in part for the article; *third,* if any valuable constituent of the article has been wholly or in part abstracted; *fourth,* if it is intended for use on vegetation and shall contain any substances which, although preventing, destroying, repelling or mitigating insects, shall be injurious to such vegetation when used.

Section 6. That the term "misbranded" as used herein shall apply to all insecticides, Paris greens, lead arsenates, or fungicides, or articles which enter into the composition of insecticides or fungicides, the package or label of which shall bear any statement, design, or device regarding such article or the ingredients or substances contained therein which shall be false or misleading in any particular, and to all insecticides, Paris greens, lead arsenates, or fungicides which are falsely branded.

That for the purpose of this act an article shall be deemed to be misbranded—

In the case of insecticides, Paris greens, lead arsenates, and fungicides: *First,* if it be an imitation or offered for sale under the name of another article; *second,* if it be labeled or branded so as to deceive or mislead the purchaser, or if the contents of the package as originally put up shall have been removed in whole or in part and other contents shall have been placed in the package; *third,* if in package form, and the contents are stated in terms of weight or measure, they are not plainly and correctly stated on the outside of the package; *fourth,* if the label does not state the chemical formula of the compound or compounds which shall constitute the insecticide, Paris green, lead arsenate or fungicide, contained within the package.

In the case of insecticides (other than Paris greens and lead arsenates) and fungicides: *First,* if it contains arsenic in any of its combinations or in the elemental form and the total amount of arsenic present (expressed as per centum of metallic arsenic) is not stated on the label; *second,* if it contains arsenic in any of its combinations or in the elemental form and the amount of arsenic in water-soluble forms (expressed as per centum of metallic arsenic) is not stated on the label; *third,* if it consist partially or completely of an inert substance or sub-

stances which do not present, destroy, repel, or mitigate insects or fungi and does not have the names and percentage amounts of each and every one of such inert ingredients plainly and correctly stated on the label.

Section 7. No license or other qualification shall be required to enable any and all persons to engage in the sale and disposal of any of the above named insecticides, fungicides or any other fungus or insect-destroying, preventing or repelling poisons, agents or preparations.

Section 8. That Section 5497 and 5498 of Lord's Oregon Laws be and are hereby repealed.

Filed in the office of the Secretary of State February 23, 1911.

REGULATING SALE OF LIME-SULPHUR SOLUTION.

Be it enacted by the People of the State of Oregon:

Section 1. No person, firm, or corporation shall sell, offer, or expose for sale, any lime and sulphur solution or compound for spraying purposes, which shall have a specific gravity of less than thirty degrees, Beaume test, nor which contains anything except products which arise from boiling lime and sulphur in water and no salt or other soluble substance shall be used therein.

Section 2. Every package of such compound or solution sold, offered, or exposed for sale shall be plainly labeled with black faced type, in letters of not less than one-half of an inch in height, stating the contents of the compound or solution and the gravity test thereof.

Section 3. Any person, firm, or corporation selling, offering, or exposing for sale any lime and sulphur solution or compound which does not comply with the provisions of this act, either as to test, ingredients, label, or otherwise, shall be deemed guilty of a misdemeanor and upon conviction thereof shall be fined not less than $10 nor more than $100, or by imprisonment in the county jail not more than sixty days, or by both such fine and imprisonment, in the discretion of the court.

Section 4. In view of the fact that this act is necessary to the public peace, safety and welfare, and because the spraying season will be over in less than ninety (90) days, an emergency is hereby declared to exist and this act shall exist from and after its approval by the Governor.

Filed in the office of the Secretary of State February 21, 1911.

ESTABLISHING STANDARD SIZES OF APPLE BOXES.

Be it enacted by the People of the State of Oregon:

Section 1. There is hereby created and established a standard size for apple boxes for the State of Oregon.

Section 2. The standard size of an apple box shall be eighteen inches long, eleven and one-half inches wide, ten and one-half inches deep, inside measurement.

Section 3. That the special size of apple boxes shall be twenty inches long, eleven inches wide, and ten inches deep, inside measurement.

Filed in the office of the Secretary of State February 20, 1911.

PROTECTING THE GINSENG INDUSTRY.

Be it enacted by the People of the State of Oregon:

Section 1. No ginseng grower, or dealer in ginseng nursery stock, either seed or roots for planting purposes, shall send by mail or express or freight, or otherwise cause to be sent into the State of Oregon, or from one county, town or person, within the boundaries of the State, to another county, town or person, ginseng seed or root stock for planting purposes, except the package, box or bag containing same shall have securely affixed thereto a printed or typewritten label, stating in plain English language, the full name and postoffice address, county and state of the grower or dealer where the seed was grown, and must state that the ginseng seed and root stock contained herein is a pure American seed or stock and not adulterated with Japanese or any other foreign ginseng seed or root stock and was grown in a ginseng garden that is known to be free from the alternaria disease or any other contagnius ginseng disease. Said label shall contain the certificate of the county or State fruit inspector, personally signed, as a corroboration of said statement, with his postoffice address.

Section 2. It shall be the duty of the person purchasing ginseng seed or root stock for planting purposes, either from parties residing within the State of Oregon, or from other states foreign to the State of Oregon, upon receipt of package, box or bag containing the same, and before opening, to submit the same to the county or State fruit inspector, or his deputy, whose duty it shall be to copy and compare the contents of the label thereon, and if it is found that he same does not conform to the provisions of this act, the package, box or bag containing same shall either be returned to the seller and shipper, at the seller's expense, or confiscated and destroyed by said fruit inspector.

Section 3. It shall also be the duty of the said county or State fruit inspector or his deputy to become familiar with the various ginseng diseases and to inspect all ginseng gardens within his county three times during each season. The first inspection to be made between May 25th and June 15th; the second between July 25th and August 15th, and the third between September 10th and October 1st, and if at any time of inspection there is found to be any ginseng disease of a serious nature, to make a note of same, and to report it at once to the Oregon Agricultural College Experiment Station, Department of Plant Pathology, at Corvallis, Oregon, whose duty it shall be to send a competent person to inspect the reported diseased ginseng garden, and if the same is found by him to be affected by the alternaria, or any other infectious disease, the garden shall at once be quarantined, by said fruit inspector, a sufficient time to enable the owner to take up the root stock in the fall to be for market; *provided*, none of said root stock or seed gathered therefrom shall be re-planted or sold to others for planting purposes; *provided further*, that if the owner of any diseased ginseng garden that is under quarantine, fails to remove and dry all of the roots that shall be contained in said affected garden, by January 1st of the following year, it shall be the duty of said fruit inspector to destroy said garden.

Section 4. Any fruit inspector, ginseng grower or dealer in ginseng, or any other person violating any of the provisions of this act, shall be guilty of a misdemeanor, and shall upon conviction thereof, be punished by a fine of not less than twenty-five dollars nor more than five hundred dollars for each offense thereof.

Filed in the office of the Secretary of State February 21, 1911.

HORTICULTURAL LAWS OF OREGON.

(*From Lord's Oregon Laws.*)

THE STATE BOARD OF HORTICULTURE.

§ 5470. *Board of Horticulture Constituted.*

There is hereby created a board of horticulture, to consist of six members, who shall be appointed by a board, consisting of the Governor, Secretary of State, and State Treasurer. One member of the said board of horticulture shall represent the State at large and shall be the president and executive officer of the board, and one member shall be appointed to represent each of the five districts as hereby created, to wit: (1) The first district, which shall comprise the counties of Multnomah, Clackamas, Yamhill, Washington, Columbia, Clatsop, and Tillamook; (2) the second district, which shall comprise the counties of Marion, Polk, Benton, Lincoln, Linn, and Lane; (3) the third district, which shall comprise the counties of Douglas, Jackson, Klamath, Josephine, Coos, Curry, and Lake; (4) the fourth district, which shall comprise the counties of Wasco, Sherman, Morrow, Gilliam, and Crook; (5) the fifth district, which shall comprise the counties of Umatilla, Union, Wallowa, Baker, Malheur, Harney, and Grant. [L. 1889, p. 126, § 1; L. 1891, p. 174, § 1; L. 1895, p. 33, § 1; L. 1899, p. 55, § 1; B. & C. § 4176.]

§ 5471. *Residence of Members—Terms of Office—Duties of President.*

The members shall reside in the districts for which they are respectively appointed. They shall be selected with reference to their knowledge of and practical experience in horticulture and the industries connected therewith, and shall be engaged in practical horticulture during their incumbency of the office of commissioner. They shall hold office for the term of four years, and until their successors are appointed and have qualified unless removed by the appointing board for failure to perform their duties. It shall be the duty of the president to visit, at least once a year, every district, and examine the orchards, nurseries, and work of the district commissioners, and ascertain whether or not the law and regulations of the board are being properly executed. He must personally inspect most of the orchards during the fruit growing season, see that the regulations of the board regarding spraying are being faithfully executed wherever insects, pests, or disease injurious to tree or fruit are to be found. He must visit the principal fruit shipping points during the shipping season, inspect the fruit shipped, and prevent the shipment of insect and pest-infested fruit. He shall give notice through the public press one week in advance of his visit to each county, giving the time and place of his visit, where he shall receive complaints of fruit growers and distribute to them printed and oral instructions regarding destruction of pests and other information, including proper methods of handling, packing, and shipping fruits. It shall also be his duty to visit, when possible, if requested by an association or a number of fruit growers, the meetings of such associations

of fruit growers, and aid them in the organization of proper associations beneficial to the growing and marketing of fruits. The president shall preside at all the meetings of the board, and may call special meetings whenever an emergency may require it. He shall make an annual report to the appointing board of the general condition of the fruit interests of the State and success of the commissioners in the work of exterminating pests and executing the law. [L. 1889, p. 126, § 2; L. 1895, p. 34, § 2; L. 1899, p. 56, § 2; B. & C. § 4177.]

§ 5472. *Secretary of Board, His Salary—Treasurer—Oath of Members.*

Said board shall employ without their number a secretary, who shall exercise the powers and discharge the duties conferred upon him by this act, and whose compensation shall not exceed $100 per month, to be paid in the same manner as other State officers. Said board shall also elect from their own number a treasurer. Before entering upon the discharge of his duties, each member of the board shall make and subscribe an oath to support the constitution of the United States and of the State of Oregon, and to diligently, faithfully, and impartially discharge the duties of his office, which said oath shall be filed with the secretary. The secretary shall make and subscribe a like oath, which shall be filed with the treasurer of the board. [L. 1899, p. 127, § 3; L. 1895, p. 34, § 3; B. & C. § 4178; L. 1905, c. 222, p. 385, § 6.]

§ 5473. *Each Member May Appoint Deputies—Their Authority.*

Each member of the State Board of Horticulture shall have authority to appoint, whenever it shall seem to him expedient, a special deputy or deputies, who shall be empowered to discharge any and all the duties prescribed for the members of said board in section 5487, but the work and authority of said deputies shall be confined to the districts of the commissioners by whom they are respectively appointed. [L. 1903, p. 251, § 1.]

§ 5474. *Compensation of Deputies.*

Any deputy appointed under the authority conferred by this act shall receive as compensation for his services $2.00 per day for each day actually spent in the performance of his duties as such deputy, and all claims for compensation of such deputies shall be audited and paid in the same manner as claims of members of the Board of Horticulture. [L. 1903, p. 251, § 2.]

§ 5475. *Expense, How Paid.*

Any expense incurred under the provisions of Section 5474 of this act shall be paid out of the appropriation allowed to the State Board of Horticulture. [L. 1903, p. 251, § 3.]

§ 5476. *Board May Receive Donations, Etc., and Select Lecturers, Meetings of.*

The board may receive, manage, use, and hold donations and bequests of money and property for promoting the objects of its formation. It shall meet on the second Monday of April and October in each year, and as much oftener as it may deem expedient, for consultation on and for the adoption of those measures that will best promote the horticultural industries of the State. It may, but without expense to the State, select and appoint competent and qualified persons to lecture

in each of the districts named in section 5470, for the purpose of encouraging and improving practical horticulture, and of imparting instruction in the best methods of treating the diseases of fruits and fruit trees, cleansing orchards, and exterminating orchard pests. [L. 1889, p. 127, § 4; B. & C. § 4179.]

§ 5477. *Office of Board, Where Held, When Open.*

The office of the board shall be located at such a place as a majority thereof may determine. It shall be kept open to the public, subject to the rules of the board, every day excepting Sunday and legal holidays, and shall be in charge of the secretary during the absence of the board. [L. 1889, p. 127, § 5; B. & C. § 4180.]

§ 5478. *Board May Make Quarantine Regulations—Violation a Misdemeanor.*

For the purpose of preventing the introduction into the State or spread of contagious diseases, insects, pests, or fungous growths among fruit or fruit trees, and for the prevention, treatment, cure, and extirpation of fruit pests, and diseases of fruit and fruit trees, and for the disinfection of grafts, scions, orchard debris, fruit boxes and packages, and other material or transportable articles dangerous to orchards, fruit or fruit trees; said board may make regulations for the quarantining, inspection, and disinfection thereof, which said regulations shall be circulated by the board in printed form among the fruit growers and fruit dealers of the State; shall be published at least four successive times in some daily or weekly paper in each county in the State before the same shall be in force therein, and shall be posted in three conspicuous places in each county in the State, one of which shall be at the county court house. Such regulations, when so promulgated, shall be held to import notice of their contents to all persons within the State, and shall be binding upon all persons therein. A willful violation of any quarantine or other regulation of said board, necessary to prevent the introduction into the State, or the shipment, sale, or distribution of any article so infected as to be dangerous to the fruit growing interest of the State, or the spread of dangerous diseases among fruit trees or orchards, shall be deemed a misdemeanor, and on conviction thereof, shall be punished by a fine of not less than $5.00 nor more than $100 for each offense, or by fine and imprisonment not less than five nor more than thirty days. [L. 1889, p. 127, § 6; L. 1891, p. 175, § 6; L. 1895, p. 34, § 4; B. & C. § 4181.]

§ 5479. *Members to Visit Districts, Inspect and Quarantine Orchards.*

It shall be the duty of the several members of the board, and of the secretary under their direction, to visit their respective districts, and to see that all regulations of the board and all provisions of law to prevent the introduction or spread of fruit pests and diseases of trees or plants injurious to the horticultural interests of the State are enforced. Any member of the board, or the secretary thereof, shall forthwith, upon the complaint of interested parties, inspect orchards, nurseries, and other places suspected to be infested with fruit pests or infected with contagious diseases injurious to trees, plants or fruits. If, upon report of any member or the secretary, the board shall be of opinion that any locality, district, orchard, or place is infested with fruit pests or infected with contagious diseases, or injurious to trees, plants, or fruits, and liable to spread to other orchards or localities to their damage or injury

so as to be a public danger, said board shall, by an order entered upon its minutes, declare such place to be under quarantine, and shall give notice thereof by posting a notice in writing in a conspicuous place upon the premises, specifying with convenient certainty what place or premises are under quarantine regulations, and by delivering a copy of such notice to the owner or person in charge of the premises, if he may be found thereon; and such place shall thereafter be subject to quarantine regulations of the board, and violation thereof shall be punishable as hereinbefore provided. As soon as, in the opinion of any member of the board, or the secretary thereof, the danger from such quarantine locality shall have ceased, he may suspend the said quarantine, and shall immediately report the fact to the board, who may confirm such action or may re-establish the said quarantine, in which case it shall not be again suspended but by action of the board. [L. 1889, p. 128, § 7; L. 1895, p. 35, § 5; B. & C. § 4182.]

§ 5480. *May Appoint Quarantine Guardians, Fix Salaries, Report Violations of Law.*

The board, and, in case of necessity during the recess of the board, the member residing in the quarantined district, or the secretary may appoint such quarantine guardians as may be needed to carry out the provisions of this act, whose duty it shall be to see that the regulations of the board and the instructions of the secretary are enforced and carried out. They shall also report to the board all infractions or violations of said regulations or of the law in regard to quarantining, disinfection, and destruction of pests. The salary of quarantine guardians shall be fixed by the board at not to exceed $2.00 per day, and shall be paid by the owners of orchards or other places under quarantine, and they may maintain an action therefor before any justice of the peace in any district in which any quarantined locality is wholly or in part located; but in no case shall they have any claim upon the State for such services. [L. 1889, p. 128, § 8; L. 1891, p. 176, § 2; L. 1895, p. 36, § 6; B. & C. § 4183.]

§ 5481. *Authority Conferred in Last Two Sections, Exercised in Emergencies.*

The powers conferred in the two preceding sections of this act shall be exercised only in great and imminent danger to the fruit interests of the State, and with the utmost caution and regard for the rights of individuals affected, consistent with the safety and welfare of the fruit interest of the whole State. [L. 1895, p. 36, § 7; B. & C. §4184.]

§ 5482. *County Inspector, When County Court May Appoint—Qualifications.*

Upon a petition of not less than twenty-five residents and fruit growers of any county in this State, the county court of said county shall appoint a county inspector, whose duty it shall be to inspect the apple and other fruit orchards of said county, and to enforce the laws now in force and that may be hereafter in force in this State, applicable to the fruit industry and to the growing, handling, and selling of fruit, fruit trees, and other nursery stock; *provided*, that the inspector so to be appointed shall be recommended and certified to be competent for such position by the State district commissioner of the State Board of Horticulture for the said county, and said county inspector shall hold his office during the pleasure of said county court. [L. 1905, c. 222, p. 383, § 1.]

§ 5483. *District Commissioners to Instruct and Supervise County Inspectors.*

It shall be the duty of the State district commissioner to instruct and educate the county inspectors as to the laws and quarantine regulations of this State, and the rules and regulations of the State Board of Horticulture. The county inspector shall perform his duties under the general supervision of the State district commissioner for said county, to whom he shall make reports in the manner prescribed by the State Board of Horticulture. [L. 1905, c. 222, p. 384, § 2.]

§ 5484. *Compensation of County Inspector, Report of Time and Expenses.*

Such county inspector shall be paid for his services, by the said county, a sum not exceeding $3.00 per day, and shall be reimbursed for his actual each outlay for team hire and railway fares for each and every day actually employed in the performance of his duties as herein provided, and the said county inspector shall report monthly to the said State district commissioner the time for which he is entitled to pay during the month next preceding, and also a statement of his own personal expenses while engaged in the performance of his duty as such county inspector during said month, and shall file vouchers showing expenditures for such personal expenses, and the said State district commissioner shall certify the same to the county court before such compensation and personal expenses shall be paid to said county inspector. [L. 1905, c. 222, p. 384, § 3; L. 1907, c. 58, p. 109, § 3.]

§ 5485. *Inspector of Adjacent County May Perform Duties When County Fails to Appoint.*

If any county for any reason fails to appoint a county inspector as herein provided, then the inspector of any adjacent county may perform such services, and his compensation and the necessary expenses incurred in the performance of his duty shall be charged against the county where the service is performed, as if he had been appointed by the county court of said county. [L. 1905, c. 222, p. 384, § 4.]

§ 5486. *Appeals From County Inspectors to District Commissioner.*

The State district commissioner of horticulture shall hear and promptly decide all appeals from the county inspectors in his district, and his decision shall have full force and effect until set aside by the courts of the State. All appeals from county inspectors to the district commissioners shall be under the form and regulations as prescribed by the State Board of Horticulture. [L. 1905, c. 222, p. 384, § 5.]

§ 5487. *Infested Trees Nuisances—Proceedings Relating Thereto—Authority to Abate.*

It shall be the duty of the several members of the board and of the secretary or the county inspectors under their direction, whenever they shall deem it necessary to cause an inspection to be made of any orchards, nurseries, trees, plants, vegetables, vines, or any fruit packing house, storeroom, salesroom, or any other place within their district, and also of any fruit trees or nursery stock shipped from beyond the limits of this State, and if found infected with any pests, diseases or fungous growth injurious to fruits, plants, trees, vegetables, or vines, or with their eggs or larvae liable to spread to other places or localities, or of such nature as to be a public danger, they shall notify the owner

or owners or persons in charge of or in possession of such articles, things or places, that the same are so infested, or in case such fruit trees or nursery stock, although apparently sound and not infested by any pest, shall have been from an infested district beyond the limits of this State, they shall also so notify the owner or owners or persons in charge of or in possession of the same, and shall require said persons to eradicate or destroy said insects or pests or their eggs or larvae, or such imported fruit trees or nursery stock of infested districts without the limits of the State, or to treat such contagious diseases within a certain time to be specified in said notice. Said notice may be served upon the person or persons, or any of them, owning, having charge or having possession of such infested place, article, or thing, by any member of the board, or by the secretary thereof, or by any person deputed by said board for that purpose, or they may be served in the same manner as a summons in an action at law. Such notice shall contain directions for the application of some treatment approved by the commissioners for the eradication or destruction of said pests, or the eggs or larvae thereof, or the treatment of contagious diseases or fungous growths. Any and all such places, orchards, nurseries, trees, plants, shrubs, vegetables, vines, fruit, or articles thus infested are hereby declared to be a public nuisance; and whenever any such nuisance shall exist at any place in the State on the property of any owner or owners upon whom or upon the person in charge or possession of whose property notice has been served as aforesaid, and who shall have failed or refused to abate the same within the time specified in such notice, or in the property of any nonresident or any property not in the possession of any person and the owner or owners of which cannot be found by the resident members of the board or the secretary or county inspector after diligent search within the district, it shall be the duty of the board or the member thereof in whose district the nuisance shall exist, or the secretary or county inspector under his or their directions, to cause such nuisance to be at once abated by eradicating or destroying said insects or pests or their eggs or larvae, or by treating or disinfecting or destroying the infested or diseased articles, or imported fruit trees or nursery stock imported from an infested district without the limits of this State. The expense thereof shall be a county charge and the county court shall allow and pay the same out of the general fund of the county. Any and all sums so paid shall be and become a lien on the property and premises from which said nuisance shall have been removed or abated, in pursuance of this act, and may be recovered by a suit in equity against such property or premises, which suit to foreclose such liens shall be brought in the circuit court of the county where the premises are situate, by the district attorney in the name and for the benefit of the county making such payment or payments. The proceedings in such cases shall be governed by the same rules, as far as may be applicable, as suits to foreclose mechanics' liens, and the property shall be sold under the order of the court and the proceeds applied in like manner. The board is hereby invested with the power to cause such nuisances to be abated in a summary manner. [L. 1895, p. 37, § 8; B. & C. § 4186; L. 1907, c. 58, p. 110, § 2.]

§ 5488. *Duties of Secretary.*

It shall be the duty of the secretary to attend all meetings of the board, and to preserve records of the proceedings, correspondence, and actions of the board, to collect books, pamphlets, periodicals, and other documents containing valuable information relating to horticulture, and to preserve the same; to collect statistics and general information

showing the actual condition and progress of horticulture in this State and elsewhere; to correspond with agricultural and horticultural societies, colleges, and schools of agricultural and horticulture, and such other persons and bodies as may be directed by the board, and prepare as required by the board reports for publication. [L. 1889, p. 129, § 9; L. 1895, p. 38, § 9; B. & C. § 4186.]

§ 5489. *Biennial Report—Compensation of Board Members.*

The board shall biennially, in the month of January, report to the legislative assembly a statement of its doings with a copy of the treasurer's reports for the two years preceding the session thereof. The members shall receive as compensation their actual expenses while engaged upon the work of the board or the enforcement of the provisions of this act, and shall be allowed $3.00 a day for the time actually employed. [L. 1889, p. 129, § 11; L. 1895, p. 38, § 11; B. & C. § 4187.]

§ 5490. *Duties of Treasurer.*

The treasurer shall receive all moneys belonging to the board, and pay out the same only for bills approved by it, and shall render annually to the board a statement in detail of all receipts and disbursements. [L. 1889, p. 129, § 12; L. 1895, p. 39, § 12; B. & C. § 4188.]

§ 5491. *Board to Report to Legislature.*

The said board shall report to the legislative assembly, commencing in January, 1891, what, if any, legislation is needed in aid of the horticultural and fruit growing interests of the State. [L. 1889, p. 130, § 14; B. & C. § 4189.]

§ 5495. *All Prunings and Cuttings Required to be Burned.*

It shall hereafter be unlawful for any person, firm, or corporation owning or operating any nursery, fruit orchard of any kind, hopyards, flower gardens, or ornamental trees to throw any cuttings or prunings from any fruit trees, nursery stock, ornamental trees, or hop vines into any public road, highway, lane, field, or other inclosure, or into any water course of any kind; but shall destroy such cuttings or prunings with fire within thirty days from the time such cuttings or prunings are made. [L. 1899, p. 97, § 1; B. & C. § 4190.]

§ 5496. *Owners of Nurseries, Etc., Required to Spray.*

It shall hereafter be the duty of any person, firm, or corporation owning or operating any such nursery, fruit orchard, hopyard, flower garden, or ornamental trees, and knowing such to be infected with any kind of insects, pests, or disease, to immediately spray or destroy the same in such manner as the fruit commissioner for his district may direct. [L. 1899, p. 97, § 2; B. & C. § 4191.]

§ 5499. *Unlawful to Import or Sell Infested Fruit.*

It shall be unlawful for any person, firm, or corporation to import or sell any infested or diseased fruit of any kind in the State of Oregon. [L. 1899, p. 98, § 5; B. & C. § 4194.]

§ 5500. *Packing, Etc., or Delivering for Shipment Infected Fruit, Etc., a Misdemeanor.*

Every person who packs or prepares for shipment to any point within the State, or who delivers or causes to be delivered to any express agent

or railroad agent, or other person, or to any transportation company or corporation, for shipment to any point without the State, any fruit or fruits, either fresh, cured or dried, that is infected with insect pests or diseases injurious to trees, shrubs, plants, fruits, or vegetables, is guilty of a misdemeanor. [L. 1899, p. 98, § 6; B. & C. § 4195.]

§ 5501. *Penalty for Violating Provisions of Act.*

Any person, firm, or corporation violating any of the provisions of this act shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not less than $25 nor more than $100. [L. 1899, p. 98, § 7; B. & C. § 4196.]

§ 5502. *Commissioner of Horticulture to Present Evidence, and District Attorney to Prosecute.*

It shall be the duty of the Commissioner of the State Board of Horticulture of the district in which a violation of this act occurs to present the evidence of the case to the district attorney, whose duty it shall be to prosecute any person guilty of a violation of this act, which prosecution may be brought in any of the justice courts of this State. [L. 1899, p. 98, § 8; B. & C. § 4197.]

(*d*) OF PACKING AND LABELING FRUIT AND NURSERY STOCK.

§ 5503. *Green Fruit Packed for Market to Be Labeled.*

Any person, firm, association or corporation engaged in growing, selling or packing green fruits of any kind within the State of Oregon, shall be required, upon packing any such fruit for market, whether intended for sale within or without the State of Oregon, to stamp, mark, or label plainly on the outside of every box or package of green fruit so packed, the name and postoffice address of the person, firm, association or corporation packing the same; *provided further*, that when the grower of such fruit be other than the packer of the same, the name and postoffice address of such grower shall also prominently appear upon such box or package as the grower of such fruit. [L. 1907, c. 11, p. 22, § 1.]

§ 5504. *False Representation as to Place of Raising or Packing Fruit Forbidden.*

It shall be unlawful for any dealer, commission merchant, shipper or vendor, by means of any false representations whatever, either verbal, printed or written, to represent or pretend that any fruits mentioned in section 5503, were raised, produced or packed by any person or corporation, or in any locality, other than by the person or corporation, or in the locality where the same were in fact raised, produced or packed, as the case may be. [L. 1907, c. 11, p. 22, § 2.]

§ 5505. *Possession of Fruit Falsely Labeled—Evidence.*

If any dealer, commission merchant, shipper, vendor or other person, shall have in his possession any of such fruits so falsely marked or labeled contrary to the provisions of section 5503, the possession by such dealer, commission merchant, shipper, vendor, or other person, of any such fruits so falsely marked or labeled shall be *prima facie* evidence that such dealer, commission merchant, shipper, vendor, or other person, has so falsely marked or labeled such fruits. [L. 1907, c. 11, p. 22, § 3.]

§ 5506. *Penalty for Violation of Act.*

Any person violating any of the provisions of this act shall be deemed guilty of a misdemeanor and, upon conviction thereof, shall be punished by a fine of not less than $5.00, nor more than $500, or by imprisonment in the county jail not less than ten nor more than one hundred days, or by both such fine and imprisonment, at the discretion of the court. [L. 1907, c. 11, p. 22, § 4.]

§ 5507. *Liability for False Representation as to Variety of Nursery Stock.*

Any person selling nursery stock, or young trees, and representing the same to be of a variety different from what said nursery stock of trees actually are, shall be required to replace all such trees with stock of the same grade and variety as the original order and shall be required to make reasonable compensation to the purchaser for expenses and loss of time due to such error having been made. [L. 1907, c. 57, p. 109.]

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